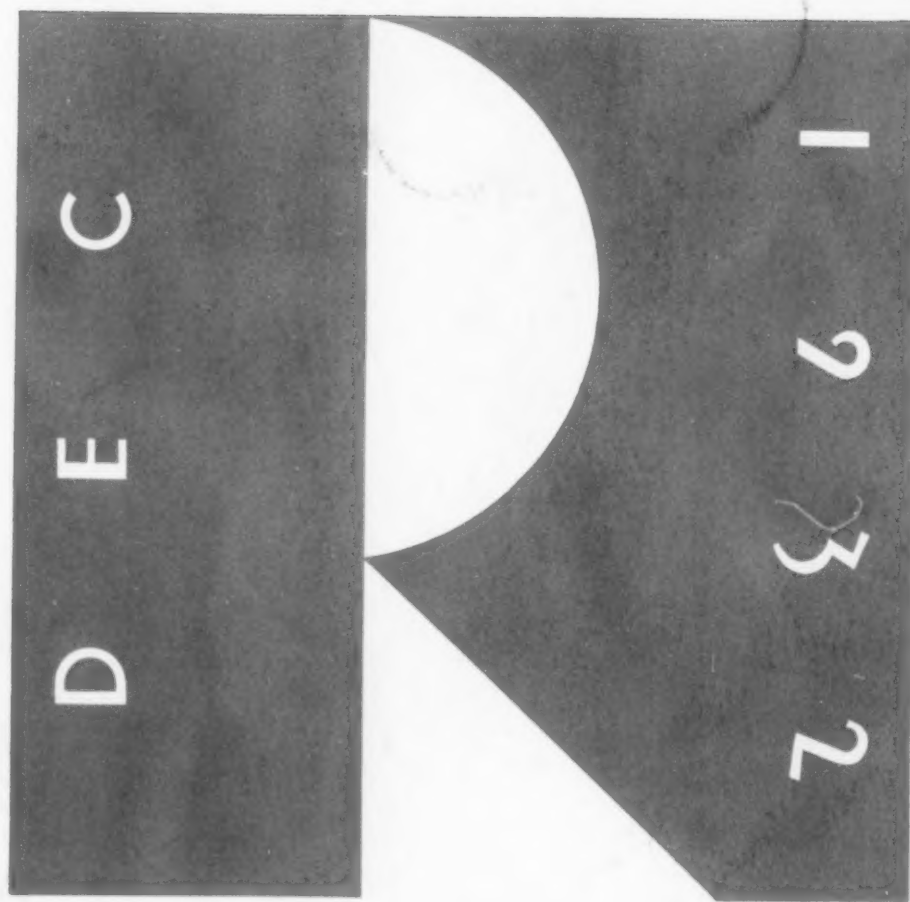


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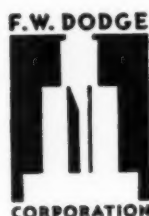
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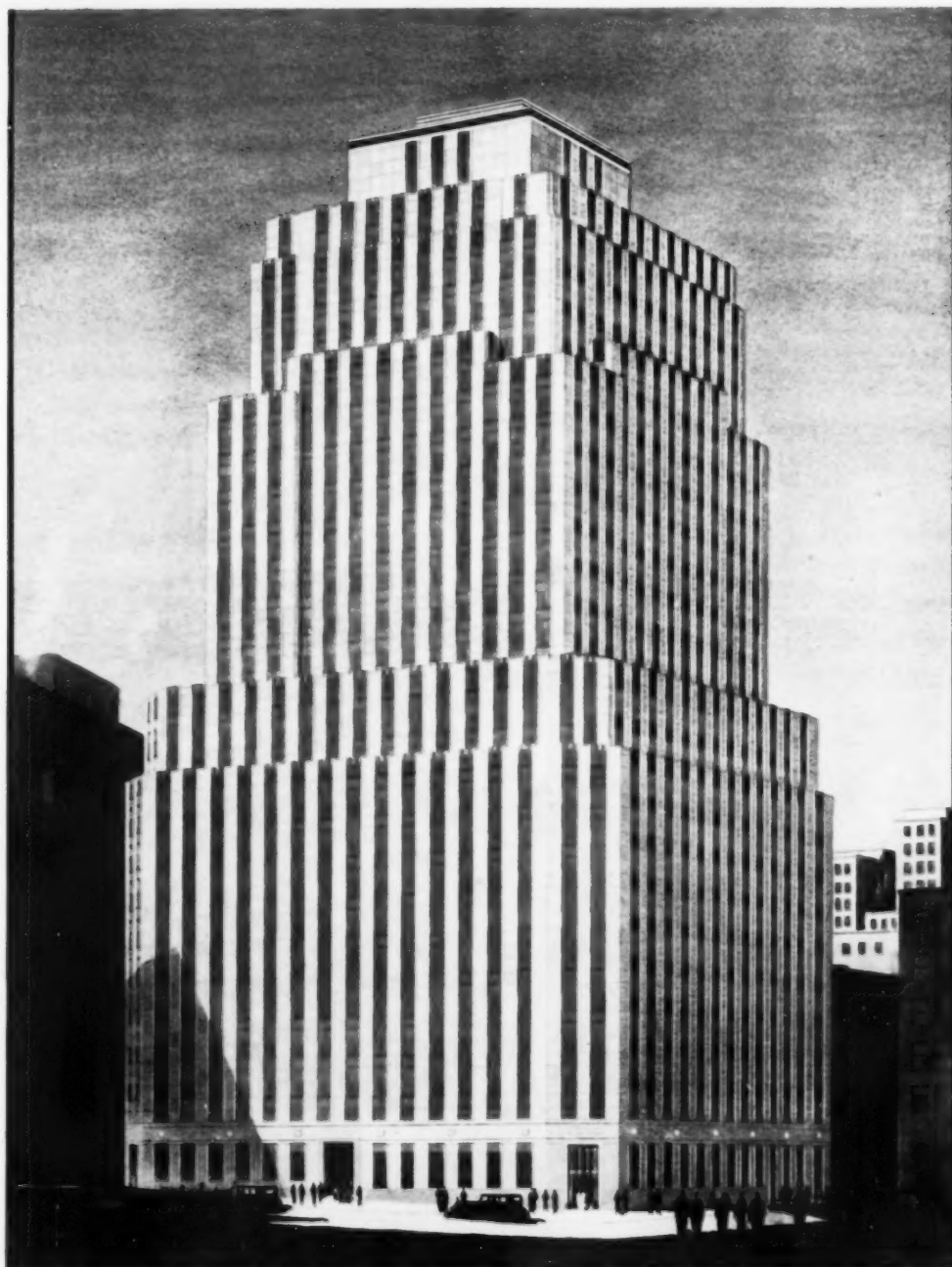
DECEMBER, 1932

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|-------------------------|--|
| Frontispiece . . . | BRIDGE OVER KILL VAN KULL
Between Bayonne, New Jersey, and Staten Island, New York
Built for Port of New York Authority
O. H. Ammann, Chief Engineer
Photograph by F. S. Lincoln |
| 347-351 . . . | SLUM CLEARANCE VS. THE COMMUNITY
By William Stanley Parker, Architect |
| 352, 353 . . . | ILLUSTRATED NEWS |
| 354-360 . . . | UNEMPLOYMENT RELIEF MEASURES |
| 361-384 . . . | PORTFOLIO OF CURRENT ARCHITECTURE
Bayonne Bridge over Kill Van Kull between Bayonne, New Jersey, and
Staten Island, New York. Designed by O. H. Ammann, Chief Engineer
for the Port of New York Authority—Cass Gilbert, Consulting Archi-
tect for the Approaches.
House of Mr. & Mrs. L. C. Strong, Washington, D. C.—Waldron C.
Faulkner, Architect; Norman T. Newton, Landscape Architect.
Lincoln-Liberty Building, 1 Broad Street, Philadelphia, Pennsylvania—
John T. Windrim, Architect.
House of Clarence P. Day, San Marino, California—H. Roy Kelley,
Architect.
House of S. B. Boyer, Athens, Tennessee—Barber & McMurry, Archi-
tects.
McMahon Shelter, New York City—W. Whitehill, Architect.
Knickerbocker Laundry Co. Plant, Long Island City, New York—Irving
M. Fenichel, Architect. |
| 385-387 . . . | KNICKERBOCKER LAUNDRY COMPANY PLANT
By Irving M. Fenichel, Architect |
| 388 . . . | ARCHITECTS' INFLUENCE IN MODERNIZATION INCREASING
By L. Seth Schnitman |
| 389-394 . . . | THE ARCHITECT AND SMALL HOUSE COSTS
By Henry Wright, Architect |
| 395, 396 . . . | ARCHITECT OR BUILDING ECONOMIST?
By Lionel M. Lebharr of Lebharr and Pierpoint, Architects |
| 397-409 . . . | TECHNICAL NEWS AND RESEARCH;
PLANNING SALES AND OFFICE BUILDINGS FOR PUBLIC SERVICE
COMPANIES
By John B. Rodgers of Bley and Lyman, Architects |
| 410, 411 . . . | ARC-WELDED STEEL PLATE WALL
By G. Fortin, Structural Engineer, Hegeman-Harris Co. |
| 412-416 . . . | LEAKY BRICK WALLS AND HOW TO PREVENT THEM
By John H. Mallon, Louisville Cement Company, Inc. |
| 32, 34 (adv.) . . . | BUILDING TRENDS AND OUTLOOK
By L. Seth Schnitman |
| 20, 22, 24 (adv.) . . . | THE ARCHITECTS' LIBRARY |
| 12, 14 (adv.) . . . | ARCHITECTS' ANNOUNCEMENTS AND CALENDAR
THE JANUARY ISSUE |
| 16, 18 (adv.) . . . | |
| 26, 28, 30, 32 (adv.) | NEW PRODUCTS AND EQUIPMENT |

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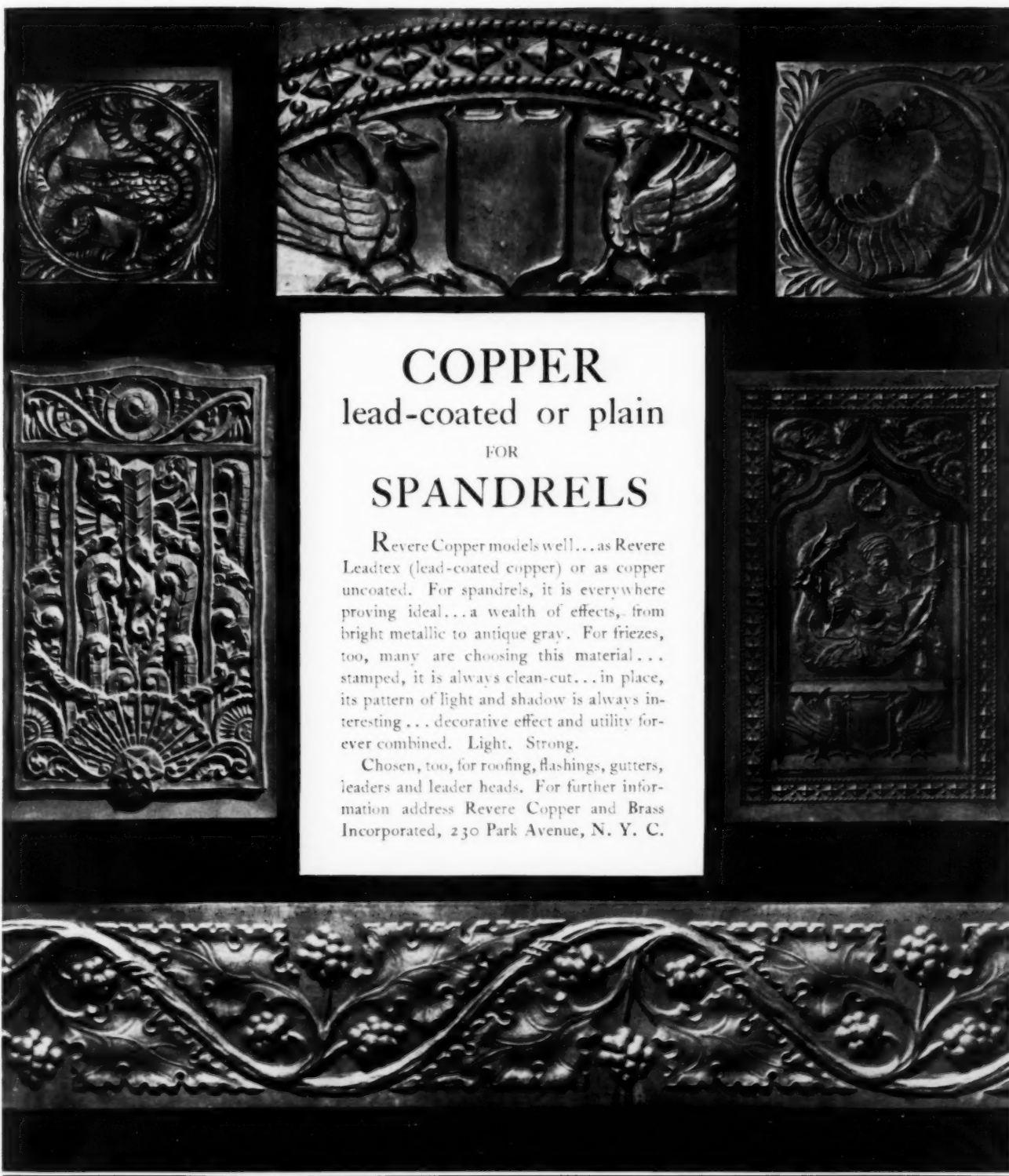
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STANDARDS FOR JUNIOR HIGH SCHOOL BUILDINGS. By N. L. Engelhardt. Bureau of Publications, Teachers College, Columbia University. 161 pages. \$1.75; paper bound edition, \$1.50

This is a checklist of requirement standards for the Junior High School Building developed to accompany "Strayer-Engelhardt Score Card" for this same building type. The book covers every phase of junior high school building planning based on experience data from architects and educators.

Consideration is given to site; building; service systems; classrooms or recitation rooms; special classrooms; general service rooms; and administration rooms. For each of these divisions detailed standards are set up with usable data certain to aid the architect.

A METHOD OF PROCEDURE AND CHECKING SCHEDULE FOR PLANNING SCHOOL BUILDINGS AND THEIR EQUIPMENT. By John J. Donovan. The Bruce Publishing Company, Milwaukee. 361 pages. \$6.50

This is an outline of the contents of a departmental school building with a schedule to check easily the preliminary and working drawings. The itemized listing of equipment and planning requirements is very complete and in step with new thought in school building design.

A school building designed with the aid of this book will be benefited by the thoroughness of the checking list. The author has long specialized in school buildings that have achieved a notable success.

ROADSIDE DEVELOPMENT. By J. M. Bennett. Macmillan. 265 pages, illustrated. \$5.

As the movement for city planning and regional planning grows, it naturally gives rise to a number of special interests. One of these is represented in this little manual on "Roadside Development," which is written by J. M. Bennett, superintendent of parks and member of the forestry board of the county road commissioners of Wayne County, Michigan. The author has drawn his material largely from the experience of his own county, in which the city of Detroit is located, and in which, he contends, more has been done in the way of roadside development along country and suburban roads than anywhere else in this country. Only in a concluding chapter does he summarize a few of the achievements and projects of other sections of the country; however, mention should be made of a paper, "County Parks and Roadside Development in Westchester County, New York," by Jay Downer, which Mr. Bennett has incorporated in his own text. The New York parkway law and other state laws affecting the possibilities of roadside development are reproduced in appendices.

Floyd N. House



From "Colonial Architecture of Cape Cod"

A NANTUCKET WINDMILL. 1746

COLONIAL ARCHITECTURE OF CAPE COD, NANTUCKET AND MARTHA'S VINEYARD. By Alfred Easton Poor, architect. William Helburn, Inc., New York. 120 pages of illustrations; 18 pages of measured drawings. \$8.40

In a forward Mr. Poor explains his twofold purpose in preparing this book: (1) to record these old buildings before they are changed by "modernization," and (2) to show the beauty achieved through simplicity and straightforward planning. Many of these houses are published for the first time. They show a sturdy type of construction, a common use of paneling on the interior, the bowed roof and other features which distinguish the Colonial architecture of this seafaring district from the rest of New England.

THE BUILDING OF CULTURES. By Roland B. Dixon. Scribner's. \$4.

A work of this kind has of course little direct bearing on architecture. There are some illustrative examples, such as Eskimo snow houses in connection with the point that Eskimos have developed nearly all the possibilities of their environment; also the changes in building which the environment produced among the English settlers of this continent. But as to indirect bearing, one may say this: the study of anthropology is in some sense a background for any subject that involves human history and human culture. An architect who has an interest in the history of his art, if he has never read any anthropology, would almost certainly come back from a prolonged reading in this subject with a different interpretation of many familiar things.

Arthur W. Colton

For EXTERIORS, TOO



Zenitherm facade, Millard Building in Seattle.
McClelland, Pinneah & Jones, Seattle, architects.

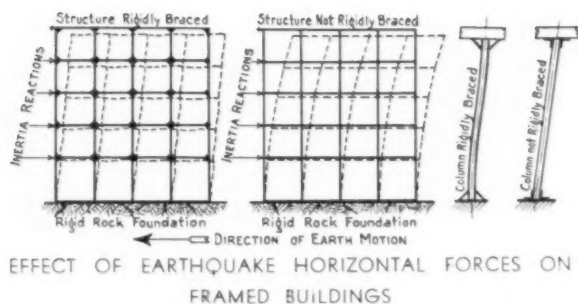
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EARTHQUAKE DAMAGE AND EARTHQUAKE INSURANCE. By John R. Freeman. McGraw-Hill Book Company, New York. 904 pages, including index. \$7.

Buildings created in areas subject to earthquake damage require a special construction so that the structural frame can withstand violent earth movements. This extensive treatise of almost nine hundred pages is a valuable statement of earthquake action supplemented by technical data on desirable precautions in building and engineering works so as to minimize or eliminate injury to construction.

HOME FINANCE AND TAXATION. Vol. II, Reports of Committees of, and published by, The President's Conference on Home Building and Home Ownership, Washington, D. C. 273 pp., tables. \$1.15 post-paid.

This book includes the reports of the Committees on Home Finance and Taxation with five and eight appendices respectively offering additional or expanded material on points covered in the general reports.

The report on Financing Home Ownership examines the American mortgage structure with a survey of existing sources, practices, causes of failure, legal aspects, and recommendations for more adequate supervision. There is also mention of the ways in which community activities may influence the economics of home ownership and financing. There are a few dissenting statements on some features of the report.

The section on Taxation and Housing deals principally with methods of freeing home ownership and real estate from excessive tax burdens due to evasions in other tax media and undue public expenditures. The appendices offer statistics on effects of various methods.

CHURCH ARCHITECTURE: BUILDING FOR A LIVING FAITH. By Frank Brannach. Bruce Publishing Co., Milwaukee. 266 pages. \$3.

This book, prepared by a Catholic priest writing under a pen name, has the ecclesiastical rather than the secular point of view in its critical appreciations of individual structures. The author shows with emphasis, however, that the actual problem of church design must be left in the hands of capable architects. Styles, altars, decoration and materials are discussed. A large number of churches are illustrated.

A HISTORY OF THE ENGLISH HOUSE (FROM PRIMITIVE TO VICTORIAN TIMES). By Nathaniel Lloyd. Published by William Helburn, Inc., New York, and The Architectural Press, London. 167 pp., text 305 pp., illus.

This history of the English house, with nearly nine hundred illustrations, covers eight hundred years of architectural development. Much of the material has appeared serially in England in *The Architectural Review*. The present collection offers period information and design knowledge to architects and students, a survey to the general reader, and, because of the excellent chronological arrangement of pictures, a ready means of identifying or dating buildings and details of the English styles.

The general text, by summarizing trends and the works and lives of architects in each century, broadens the study to include general social history which cannot be rightfully separated from the essential industry of shelter.

Although the great number of examples require treatment by relatively small pictures, the photography is good. Each example is approximately dated and a descriptive caption printed on the same page. The organization of the illustrated material is noteworthy, with separate sections each devoted to the full periodic development of its particular subject. This clearly traces evolution and the action of exterior influences upon domestic architecture and is the most valuable feature of the volume.

The historical text is interspersed with many quotations from source material and full of interest to even the casual reader.

ACOUSTICS AND ARCHITECTURE. By Paul E. Sabine. McGraw-Hill Book Co., Inc., New York. \$3.50.

It was necessary that the theory of acoustics should be developed with direct relation to architecture. Buildings in their form and materials should be shaped with recognition of acoustical principles. Knowledge of the behavior of sound in rooms is a necessary part of the architect's equipment and this book is a scholarly and reliable source for such guidance.

Mr. Sabine's aim has been twofold: (1) to give to students of physics and engineering an adequate grasp of the physics of sound in an enclosure, and (2) to present to architects and engineers the results of recent scientific study of the problems of the control of sound in buildings. It has been the purpose throughout to keep the necessary mathematical treatment of the subject within the compass of two years of college training in mathematics.

The chapter on Acoustics in Auditorium Design is of particular value. It is devoted to a consideration of requirements which, if met, lead to desired acoustical results. Defects due to curved and ellipsoidal and other shapes are discussed. There are recommendations for correcting defects in existing auditoriums.



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CALENDAR OF EXHIBITIONS AND EVENTS

December 5-10 Tenth National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York City.

1933

January Exposition of modern architecture and city planning in the Department of Agriculture Building, in Algiers.

January 15 Closing date for nominations of contestants for the LeBrun Travelling Scholarship. Apply to the Secretary of any A.I.A. Chapter or to the LeBrun Scholarship Committee, 522 Fifth Avenue, New York City.

January 18 Closing date for applications for James Templeton Kelley Fellowship. Apply to Niels H. Larsen, Secretary, Committee on Education, Boston Society of Architects, 814 Statler Building, Boston.

January 20 "A World Cruise"—the 14th annual winter ball of the Society of Beaux-Arts Architects at the Hotel Waldorf-Astoria in New York.

January 23-25 Annual meeting of the American Society of Heating and Ventilating Engineers, in Cincinnati.

February 1 Closing date for entries in competitions for fellowships at the American Academy in Rome. Address Roscoe Guernsey, Executive Secretary, American Academy in Rome, 101 Park Avenue, New York City.

February 23-25 Eleventh annual North American Conference on Church Architecture at the Stevens Hotel, Chicago. An exhibit of ecclesiastical architecture will be held under auspices of the "Christian Herald."

April 23-30 Better Homes week, an educational movement under auspices of Better Homes in America, 1653 Pennsylvania Avenue, Washington, D. C. Demonstrations of new and remodeled houses, lectures, contests, etc., are urged.

June "A Century of Progress," International Exposition at Chicago.

Thomas and Baker, architects, have moved from 232 Madison Avenue to Room 1001, 101 Park Avenue, New York City.

F. A. Ludewig Company, architects, announce that they have moved from 3115 South Grand Boulevard to 4923 South Kingshighway, St. Louis, Missouri.

Ernest R. Richards, architect, has changed his address from 2123 Summerdale Avenue to 3822 North Clark Street, Chicago, Illinois.

Peterson and Almon, architects, have moved their offices from the Huron Building to the Law Building, 721 Minnesota Avenue, Kansas City, Kansas.

Richard W. Buckley, architect, has changed his address from First National Bank Building, Mamaroneck, New York, to 110 West 40th Street New York City.

John C. B. Moore, architect, has moved his office to 130 West 42nd Street, New York City.

G. M. Grimes, architect, has opened an office at 633 South 5th Street, Louisville, Kentucky, for the general practice of architecture.

ANNOUNCEMENTS

LEBRUN TRAVELLING SCHOLARSHIP

A nationwide competition for the LeBrun Travelling Scholarship of \$1,400 is announced by the New York Chapter of the American Institute of Architects. The scholarship entitles the winner to not less than six months' study in Europe. All contestants must be practicing architects or draftsmen, U. S. citizens between the ages of twenty-three and thirty, who have been actively engaged in their profession for at least three years, and have not previously been beneficiaries of any travelling scholarships. They must be specially nominated by an A. I. A. member.

The problem for the competition will be announced early in January. Nomination blanks may be obtained from the secretary of any Chapter of the American Institute of Architects, or from the LeBrun Scholarship Committee, 522 Fifth Avenue, New York City. Nominations must be received before January 15.

ROME PRIZES

The American Academy in Rome has announced its annual competitions for fellowships in architecture, landscape architecture, painting, sculpture and musical composition. The competitions are open to unmarried men not over 30 years of age who are citizens of the United States. The stipend of each fellowship is \$1,250 a year with an allowance of \$300 for transportation to and from Rome. Residence and studio are provided without charge at the Academy, and the total estimated value of each fellowship is about \$2,000 a year. The term of each fellowship is two years in architecture and landscape architecture, three years in painting, sculpture and musical composition.

Entries for competitions will be received until February 1. Circulars of information and application blanks may be obtained by addressing Roscoe Guernsey, Executive Secretary, American Academy in Rome, 101 Park Avenue, New York.

JAMES TEMPLETON KELLEY FELLOWSHIP

This fellowship with an income of \$2,500 for one year is to be assigned to an individual of proved ability, whether a student, an instructor, a draftsman, or a practicing architect, for foreign travel. It is open to any man or woman residing within the area under the jurisdiction of the Boston Society of Architects (Maine, New Hampshire, Vermont and Massachusetts), a citizen preferably over thirty years of age. The award is made on recommendation of the Committee on Education of the Society.

Applications should be in the hands of Niels H. Larsen, Secretary of the Committee on Education of the Boston Society of Architects, 814 Statler Building, Boston, on or before January 18, 1933, and should state the applicant's age, education, experience, present occupation, and suggestions for his work abroad.



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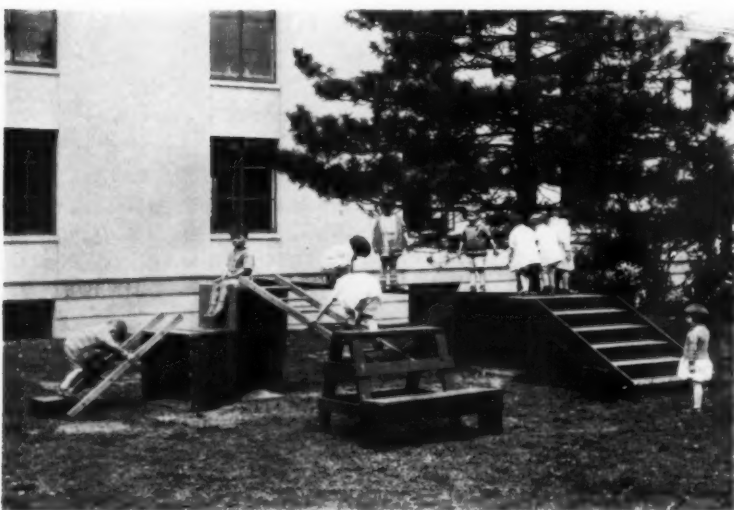
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PLAY SPACE FOR CHILDREN SHOULD BE PLANNED AS PART OF A
RECREATIONAL CENTER FOR THE COMMUNITY

FEATURES IN JANUARY ISSUE

REMODELING CITIES AND TOWNS: Recreation Centers and Community Buildings. Just as in the case of individual buildings, there will be extensive remodeling of cities and towns during the period of business recovery. Increased leisure will demand additional recreation centers for adults as well as for children. This study should serve as a helpful guide to the architect in determining how much space should be devoted to playgrounds, the town hall, community swimming pools, libraries and schools.

BELL TELEPHONE COMPANY BUILDING, Brooklyn, N. Y. Voorhees, Gmelin and Walker, architects. This new structure is a building of simple cubical masses with decorative brickwork. Working drawings and elevations, interiors and details, and many full-page illustrations accompany the article.

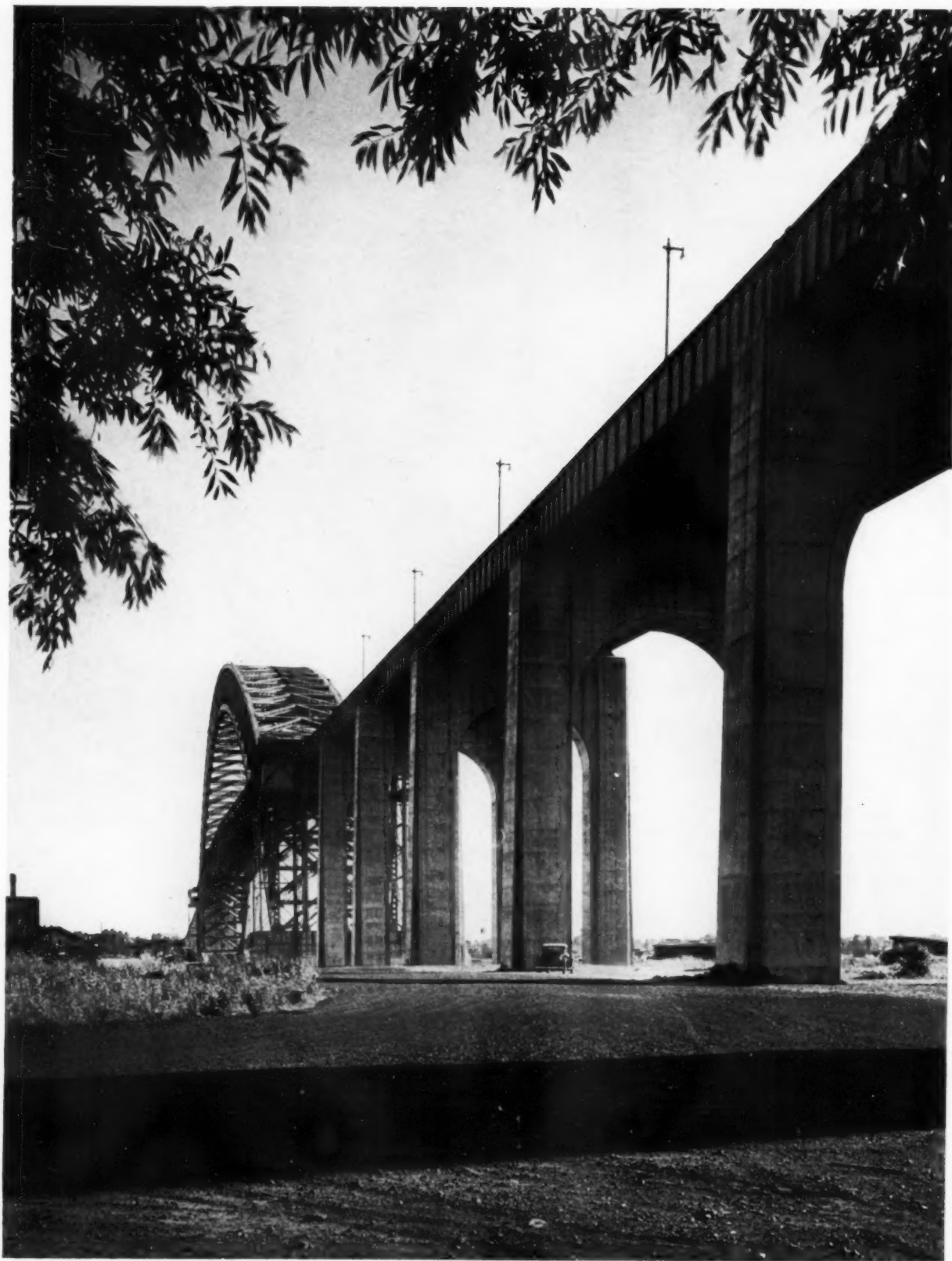
PAYNE WHITNEY GYMNASIUM AT YALE UNIVERSITY. John Russell Pope, architect. Recently awarded a prize by the architectural jury of The Olympic Games World Competition for a building devoted to sports.

INDIANA UNION BUILDING AT INDIANA UNIVERSITY. Granger and Bollenbacher, architects. The merits of this building have been widely acclaimed.

BREWERY DESIGN

Some architects have already prepared plans for brewery projects in anticipation of the modification of the Volstead Act. This article will list the principles of brewery design and supply planning and equipment data, together with many drawings, which it is believed will be of practical assistance.

AMERICAN ARCHITECTURE IN JAPAN. The work of Antonin Raymond, architect, an American architect who worked with Cass Gilbert, H. Van Buren Magonigle and Frank Lloyd Wright. About eight years ago he established practice in Japan and has built more than 400 buildings there, including factories, embassy buildings, country clubs and residences. The buildings illustrated were constructed as well as designed by Mr. Raymond's own organization.



F. S. Lincoln

BRIDGE OVER KILL VAN KULL BETWEEN BAYONNE, N. J., AND STATEN ISLAND, N. Y.
BUILT FOR PORT OF NEW YORK AUTHORITY
O. H. AMMANN, CHIEF ENGINEER

SLUM CLEARANCE VS. THE COMMUNITY

By WILLIAM STANLEY PARKER, Architect

Not more new suburban developments but slum clearance and rehabilitation of down-at-the-heel districts: that is the order of the day according to many students of housing and population statistics. The conclusion seems sound.

For several prosperous years we focused attention on small house developments in the outlying districts. In some few cases the amenities have been fostered and communities have been developed, planned for economy, safety, health, convenience and friendliness. Far more often one house has followed another; a row of two-family houses has added itself to the edge of an already monotonous reiteration of similar units, increasing a district that for years has been spreading its blight over the adjacent open fields like an irresistible glacier, a blight of cheap mediocrity void of any good qualities of design or construction, except for mechanical conveniences.

We have stood by and watched these acres of new housing grow as decreed by the speculative builder, the curb-broker in real estate, moving from place to place and leaving in his wake housing accommodations built according to a pattern that he had found he could sell. Already these districts have produced community problems which will continue to increase—problems of fire hazards, of depreciating values, of play spaces that should have been provided by the housing development but now must be provided by the community. These problems we are facing and will continue to face, but they are apart from the problem of slum clearance.

With our eyes on our suburbs, we have paid scant attention to the nearer-by housing districts, long occupied by poorer citizens and for years progressively depreciating in value and character. Large numbers of our citizens desire living accommodations in such sections which are near their places of employment, but we have given little attention to the various kinds of housing they need—rooming or lodging houses, small kitchenette

In this article Mr. Parker points out the responsibility of the community in slum clearance. Where taxes have been collected on overcrowded land, the community has shared in the profits. If the blighted area is to be removed, then the community should aid by contributing the equivalent of some of the taxes it has collected.

The problem of remodeling and modernization extends to cities and towns as well as individual buildings. Slums must be eliminated and new housing provided. New recreational centers are needed. With this purpose in mind and in line with Mr. Parker's suggestions, The Record will publish in the January issue a technical study checklisting the requirements of pools, playgrounds and similar community facilities.

apartments of one or two rooms for the unmarried, larger apartments for families, even small houses for those who would like them if financially possible.

But let's not indulge in overemphasis. None of our present day community problems has a simple complete answer. The suburbs will continue to warrant our attention, but for the present there is good reason to focus our attention on the more neglected field of our depreciated districts and to see what we can do about them. The Government has made available large sums for slum clearance and low-rental housing projects—*under certain conditions*. Do these conditions automatically make it impossible for us to use the funds? What are the controlling elements of the problem? What economic factors must be allowed to play their part? What general community interests and responsibilities, if any, are inherent in these slum areas every one desires to eliminate?

One newly developed fact will force us to reconsider some of our previous tendencies. The declining rate of population increase, and the predicted stabilization of population in so near a future as 1960, should make us review pretty carefully the extent of our undeveloped and partially developed areas and the population densities already conceived for our developed sections. Clearly it will be folly to lay out public utilities for suburban districts for which there can be no demand. Equally clearly it will be unwise to establish a population density in our inner districts out of scale with the

areas of the districts and the calculable demand. It may mean stabilizing land values in these districts at a lower level than has been hoped for in the past. The added difficulty that this involves for slum clearance projects will be indicated shortly.

There appear to be just three main variables that go to make up a slum clearance problem: (1) cost per square foot of developed land, (2) average cost of housing unit, (3) number of families per acre. There is nothing new about this, but at the risk of assuming a kindergarten approach to the subject, let's consider each of these variables and its effect on any attempt to rehabilitate a slum area.

(1) *Cost per square foot of developed land.* This is, of course, the big snag that has tripped up so many attempts to improve housing conditions in depreciated districts. It is hard enough to carry the high land cost that has been created but to carry also the value of the old buildings which must be destroyed is generally too much to expect of any new housing units.

This situation is not in any way helped by the Reconstruction Finance Corporation funds now available. Indeed, in order to use these funds the difficulty is made as acute as possible by the limit on required rentals. As in the case of tax-exempt housing in New York, slum clearance projects using Reconstruction Finance Corporation funds must limit dividends and rentals, and submit to complete supervision by state or local authorities. To insist on limited dividends is no particular hardship. The difficulties involved will do that in all probability without the need of state supervision. If this were not so, slum clearance projects would be a normal type of speculative real estate development.

Only a certain percentage of the site can be occupied with buildings so as to provide light and air according to modern standards and adequate play space for the smaller children. This raises a point of community interest and perhaps of responsibility that seems worthy of consideration. No such requirements were laid down when the existing slum structures were built. The spirit of those days held that the more building you could get on a lot, the more revenue you could obtain. There being no standards of light and air or even of sanitation worth talking about, housing was merely a number of rooms with a kitchen sink and a place for a kitchen stove. These structures were built accordingly, rented profitably for years, and taxes paid thereon.

The community was a party to the transaction. It aided and abetted overcrowding of residence districts and through the taxes collected shared in the profits. If now the overcrowding is found to be a community liability which should be done away with, is it reasonable to put upon the new real-estate operation the entire financial burden? Is there not sound logic and economic justification in suggesting that the community should stand some

share of this burden? There is in most of us an instinctive opposition to special privilege through tax exemption. If, however, we now find that certain undesirable conditions have been fostered by common consent and with public profit through taxes, why may we not claim that it is only fair that the community should help to remove these undesirable structures by contributing the equivalent of some of the taxes it has collected.

We cannot recover from those who have received gain from excessive use of the property, except insofar as we may be able to get the present owners to accept a reduced valuation in taking over their property for the new development. It can, of course, be argued that the community gave due return for the taxes collected. However, we may look at this problem in a broad way and recognize the general community responsibility for the slum conditions, as well as the community benefits that will accrue from their elimination, and ask the community to make some contribution toward the desired result, if it is not otherwise obtainable.

The question of play spaces raises a point that suggests a possible way in which the community could help. Present good practice requires those who develop raw land for housing to provide adequate play spaces for the families they intend to house. If this had been done in the past, slum congestion would have been prevented at least in part. Past practice, however, in most of our cities has permitted congested building and then later required the purchase by the community of the necessary parcels of land and buildings to provide needed playgrounds. In this wasteful process the community does substantially what I have suggested: it pays back, for the property needed, the equivalent of some portion—if not all—of the taxes it has collected on the properties built on the playground areas that really ought never to have been built on. Therefore, we have good precedent for the suggestion.

This process, while it has provided play spaces, has been guided by expediency rather than sound planning, and the money spent for these open spaces has not helped to improve surrounding housing, but has even tended to hurt the housing in their immediate vicinity. It will be found that they are generally forced to occupy valuable street frontages of no value to the playground, and by their too frequent lack of trees and grass and their disturbing noises depreciate the value of adjacent dwellings. The money paid for the properties is taken by the former owners and is in no way usable for the improvement of surrounding properties. Herein lies an opportunity that should not be lost.

I suggest that cities, in such cases, adopt the policy of buying built-up property for play spaces only under such conditions as will permit the money spent to be of help in developing better housing in the surrounding neighborhood. This policy would be at least one step towards making rehabilitation financially practicable. It would mean



Ewing Galloway

Municipal expenditures for open play spaces have not always improved surrounding housing, as this view of a park in the Lower East Side tenement district of New York shows. Generally such recreational areas occupy valuable street frontages which are of no value to the playground. Built-up property should be purchased by the city only under conditions of sale and maintenance which will also improve the neighboring areas.

that if some development company should present a scheme, satisfactory to the city authorities, for amalgamating a large tract and devoting a portion of it to play space, the city would take over the play space at an agreed price, which would thus reduce the cost of land to be carried by the new housing. This perhaps will not be found a controlling factor but it may well be a substantial help.

If this were done with an agreement for maintenance of the play space by the development company, the city could afford to pay somewhat more in view of the elimination of maintenance costs, and probably the company could maintain the playground more cheaply than the city. This scheme would mean the development of a large enough area to warrant a playground unit. At least the city could insist on this and thus stimulate an operation large enough to protect its own environment and assist in reducing the cost per square foot of the developed land to be supported by the new housing.

(2) *Average cost of housing unit.* Assuming an ever increasing demand for housing, one can readily argue the reasonableness of increasing the population density of a given district. Thus in slum clearance the underlying financial problem could be solved by putting more families on the

plot than there were before. But if constantly increasing population is gradually becoming a thing of the past, this solution can hardly be considered as a permanent procedure. There are only two ways to meet the finally developed land cost, whatever it may be and however it may be reduced by community action such as has been suggested. One must either increase the number of families or increase the average cost of the housing units.

It is not difficult to prepare a table that will show at a glance the average land cost per housing unit which will result from a given cost of land per square foot and a given number of families per acre. Much of such a table will be outside the realm of practicability and only the known facts in any particular case will show what is reasonable and what is not.

The character of the proposed site and the existing occupancy of the district will determine what average rental can be reasonably expected, and this will determine the reasonable amount each unit can carry in land cost and the resultant number of families per acre required to balance the equation. If this density is too large, the project is impossible. Several large rehabilitation projects, familiar to all, were founded on a complete change of occupancy, substituting relatively high-priced housing for a very low grade of previous occupancy. They also involve a relatively high density of population

**CHART SHOWING RELATION BETWEEN
LAND COST - POPULATION DENSITY - LAND COST PER FAMILY**

LAND COST		FAMILIES PER ACRE												
¢ PER SQ. FT.	\$ PER ACRE	5	10	15	20	25	30	35	40	45	50	75	100	150
.10	4356	871	435	290	217	174	145	124	108	96	87	58	43	29
.20	8712	1742	871	580	435	348	290	248	217	193	174	116	87	58
.30	13068	2613	1306	871	653	522	435	373	326	290	261	174	130	87
.40	17424	3484	1742	1161	871	696	580	497	435	387	348	232	174	116
.50	21780	4356	2178	1452	1089	871	726	622	544	484	435	290	217	145
.60	26136	5227	2613	1742	1306	1045	871	746	653	580	522	348	261	174
.70	30492	6098	3049	2032	1524	1219	1016	871	762	677	609	406	304	203
.80	34848	6969	3484	2323	1742	1393	1161	995	871	774	696	464	348	232
.90	39204	7840	3920	2613	1960	1568	1306	1120	980	871	784	522	392	261
1.00	43560	8712	4356	2904	2178	1742	1452	1244	1089	968	871	580	435	290
1.10	47916	9583	4791	3194	2395	1916	1597	1369	1197	1064	958	638	479	319
1.20	52272	10454	5227	3484	2613	2090	1742	1493	1306	1161	1045	696	522	348
1.30	56628	11325	5662	3775	2831	2265	1887	1617	1415	1258	1132	755	566	378
1.40	60984	12196	6098	4065	3049	2439	2032	1742	1524	1355	1219	813	609	406
1.50	65340	13068	6534	4356	3267	2613	2178	1866	1633	1452	1306	871	653	435
1.60	69696	13939	6969	4646	3484	2787	2323	1991	1742	1548	1393	929	696	464
1.70	74052	14810	7405	4936	3702	2962	2468	2115	1851	1645	1481	987	740	494
1.80	78408	15681	7840	5227	3920	3136	2613	2240	1960	1742	1568	1045	784	522
1.90	82764	16552	8276	5517	4138	3310	2758	2364	2069	1839	1655	1103	827	551
2.00	87120	17424	8712	5808	4356	3484	2904	2489	2178	1936	1742	1161	871	580
4.00	174240	34848	17424	11616	8712	6969	5808	4978	4356	3872	3484	2323	1742	1161
6.00	261360	52272	26136	17424	13068	10454	8712	7467	6534	5808	5227	3484	2613	1742
8.00	348480	69696	34848	23232	17424	13939	11616	9956	8712	7744	6969	4646	3484	2322
10.00	435600	87120	43560	29040	21780	17424	14520	12446	10890	9680	8712	5808	4356	2904

THIS TABLE IS DESIGNED TO SHOW READILY WHAT DENSITY OF POPULATION, IN FAMILIES PER NET ACRE, IS REQUIRED FOR A GIVEN AVERAGE COST OF LOT AND A GIVEN COST PER SQ. FT. OF DEVELOPED LAND.

EXAMPLE: ASSUME AVERAGE COST OF LOT TO SUIT THE INTENDED CLASS OF OWNERS TO BE \$750. AND DEVELOPED COST OF LAND TO BE CARRIED BY HOUSING TO BE 30¢ PER FT.

ANSWER: REQUIRED DENSITY IS BETWEEN 15 AND 20 FAMILIES PER ACRE

CHART DESIGNED BY W. S. PARKER.

DRAWN BY THE EMERGENCY PLANNING & RESEARCH BUREAU, INC.

This chart eliminates entirely the cost of new dwellings proposed in place of old housing and uses merely the land cost per housing unit. Opinions vary as to the relation between the cost of the average housing unit and the cost of land it can reasonably carry. A housing unit built to sell at \$4,000 including land will carry, say, \$750 for the land. Average cost of housing unit thus is fairly represented by average cost of land it can carry. Land cost per family relates to net cost to be supported by housing, after making proper deductions for any part that may be defrayed by commercial occupancy, schools, theaters, or income apart from that of proposed housing.

in order to balance the land cost. By these two expedients such schemes become practicable real estate projects without state or governmental aid. But these expedients cannot obtain in projects using Reconstruction Finance Corporation funds owing to the limited rental requirements. This type of housing must be for the low-income groups, thus removing the principal factor that has heretofore made such projects possible.

(3) *Number of families per acre.* If perforce we are to house approximately the same social group which now occupies the present undesirable structures, it would seem imperative that we substantially increase the number of families housed to meet the financial requirements. Can this be done within the existing zoning limitations on height? Each case must of course be determined on its own facts. It is enough here to point out the handicap to slum clearance projects inherent in reasonable limitation on permitted density, resulting from limitation on height and on percentage of lot covered, and the increasing effect of such handicap due to the inevitable tendency towards fewer families per acre than may have been heretofore anticipated because of the indicated change in population growth.

Conclusion. If, as suggested, a slum clearance project is limited in the number of families per acre that can be housed, and also is limited in the rentals that can be charged, then it seems highly probable that, in most cases, the financial equation cannot be balanced unless some way is found to reduce the developed cost of the land which must be carried by the new housing units. This apparently can be done only by a philanthropic contribution, or by community cooperation which takes the form of direct subsidy tax exemption, or jointly with these, by the purchase of a part of the tract left open for play space. The last will not likely of itself be adequate to establish a sound financial basis for the project.

If this analysis does not neglect some important factor, the question of slum clearance seems to resolve itself into the question of whether the community interest in doing away with slum conditions, the community responsibility for their creation and the community profiting from their use in the past, warrant participation by the community in their clearance through some form of financial relief that will offset in whole or in part the cost of the existing structures which the new housing cannot be expected to carry.

CAN THE FEDERAL HOME LOAN BANKS AID BUILDING?

It is the purpose of the Federal Home Loan Bank System to increase the supply of first mortgage money for home owners by advancing money to Building and Loan Associations, Insurance Companies, Savings and Loan Associations and Savings Banks, secured by their mortgages as collateral. In this manner, they will have additional money to lend on first mortgages to home owners in their communities.

It is not the intention of the Federal Home Loan Bank to engage in competition with existing mortgage lending institutions. Instead, the object of the System is to provide eligible institutions with still more money to lend on first mortgages to home owners.

Those desiring first mortgage loans on homes should first call on the Building and Loan Associations, Savings and Loan Associations, Savings Banks, agents of Insurance Companies or other mortgage lending institutions in their localities. Where such eligible institutions require additional funds to lend on first mortgages, they may obtain them by joining the Federal Home Loan Bank System.

Note: Direct loans to home owners can be made *only* (1) on well-constructed, well-situated homes occupied by the owner, who must demonstrate that he can make regular payments, (2) for not more than 40% of a fair appraisal, and (3) provided

there is no eligible institution in the vicinity that can borrow money from a Home Loan Bank.

The Federal Home Loan Bank does *not* lend on or discount mortgages on business property. It does *not* lend on or discount mortgages on homes worth more than \$20,000. It does *not* lend money to pay interest or taxes. It does *not* handle second mortgages.

A. I. A. URGES HOUSING STUDIES

Studies enabling states and cities to formulate projects for low rent housing and slum clearance with the aid of loans from the Reconstruction Finance Corporation should be started at once throughout the country, Abram Garfield, president of the Cleveland Chapter of the American Institute of Architects, declares in an A. I. A. statement.

"An architect's plan even if incorporating all of the requirements of recognized good practice will not be enough.

"There should be a statement of the population of the district and its changes; its vacancies, the number and size of building permits during the past ten or twenty years; the number and condition of mortgages and foreclosures; the character and foot frontage of stores and their history during the past two or three decades. This involves a complete inventory of the real estate and a careful analysis and interpretation of the facts."

ILLUSTRATED NEWS

Architect's drawing of Hillside Homes, construction of which is to be begun immediately through loan of funds by the Reconstruction Finance Corporation. Accommodations for 1,200 families at an average rental of \$11 per room per month will be provided.



HILLSIDE HOUSING PROJECT MAY BE FINANCED BY R. F. C.

These model apartments, to be built in the Bronx, New York, with the help of a loan granted by the Reconstruction Finance Corporation will cost approximately \$6,000,000, including the land. The project will be known as Hillside Homes. Central figures in this development are Nathan Straus, Jr., owner of the site; Andrew J. Eken, vice president of Starrett Brothers & Eken, contractors, and Clarence S. Stein, architect.

The State Housing Board has given full approval to the construction as a limited dividend project under the State Housing Law. This approval is in compliance with the emergency relief measures passed by Congress which required that the projects shall be undertaken by limited dividend corporations and have the approval of local housing authorities.

The site was at one time a farm, but no buildings have stood upon it in recent years. A 100-foot strip of land along the Boston Post Road is retained for private development. Because no slum clearance is involved, the project has been criticized by real estate owners who complain of existing unrented space.

Clarence Stein who was the architect of both the Sunnyside Gardens and Radburn, New Jersey, housing developments has designed this proposed self-contained community with 2½ acres of playground space. The development will contain apartments for approximately 1,200 families at rents to average \$11 per room per month. The buildings will be chiefly four-story walk-up apartments, but will also include a smaller group of six-story tenant-operated elevator buildings. The buildings cover only 34 per cent of the land.

All courts between and about the buildings are at least 80 feet wide and every room in every apartment has windows into open space. Each apartment will have complete cross ventilation and will be so placed that sunlight can enter every room during at least a part of the day.

MODERNIZATION PROGRAM UNDER WAY

Nearly \$71,000,000 has been pledged by a number of companies reporting to the National Committee on Industrial Rehabilitation as available for modernization and expansion programs to be begun at once or which are in progress, according to a report by the chairman of the committee, A. W. Robertson, of Pittsburgh. The committee's program for industrial modernization was launched late in August. The \$71,000,000 which will be expended by reporting companies is to provide for new machinery, equipment and plant facilities and improvements in numerous industrial plants and in retail establishments.



Wallace

UNITED STATES CUSTOM HOUSE, PHILADELPHIA
RITTER AND SHAY, ARCHITECTS

The lower three stories of this 17-story building will be used for major activities of the Custom House and Appraisers Stores. Upper stories will provide office space for other Federal activities.

ENGINEERS AID IN SPEEDING EMERGENCY CONSTRUCTION

Applications for loans under the self-liquidating provisions of the Emergency Relief and Construction Act aggregate more than a billion dollars, according to the American Engineering Council, which is organizing the engineering profession to cooperate with the Reconstruction Finance Corporation in speeding construction projects contemplated by Congress.

Engineer activity is now under way following the appointment of thirty-seven engineers as members of the advisory committees of the Corporation's loan agencies. From now on, it is believed, the work of each of these agencies will be coordinated so effectively that the task of the Engineers' Advisory Board of the Corporation at Washington, to which all applications are submitted for final engineering approval, will be materially simplified.

Much of the difficulty encountered by the Board, it is disclosed, arises from the inadequate engineering data which frequently accompanies applications for loans. Many applications are insufficiently descriptive of the projects proposed, and lack essential detailed information, delaying decisions by the Board.

BAUHAUS REOPENS

The Bauhaus School which was evicted from its quarters in Dessau by the State has reopened in Berlin. The teaching staff remains the same, and Professor Miës van der Rohe, who became Director in 1930, continues to be head of the School. Anyone wishing information about the School may apply to Philip Johnson, the American representative, at the Museum of Modern Art, 11 West 53rd Street, New York.



AMERICAN ARCHITECTS WIN SECOND PRIZE IN ENGLISH COMPETITION

Dawson, Oliver and Associates, New York, were recently awarded second prize in the Scarborough Hospital and Dispensary competition. First prize was won by Wallace Marchment. The competition drawings were exhibited during November in the Building Center in London.

RAMMED EARTH WALLS TO BE TESTED

Construction of a building with walls of rammed earth has just been completed by the Bureau of Agricultural Engineering at the U. S. Department of Agriculture Experiment Farm in Arlington County, Virginia. The walls are of clay loam subsoil—from a nearby excavation—rammed between forms, and are built in sections 10, 12 and 16 inches thick to determine the most desirable wall thicknesses. Concrete footings extend from below frost line to about 12 inches above ground level. The exterior surfaces are divided into more than 30 sections, finished and waterproofed in different ways (including cement stucco and lime stucco each applied in five different ways) and more than 20 kinds and combinations of paints, washes and bituminous products. Effects of weather should show which of these treatments is best adapted to this climate, according to the bureau. Inside walls are whitewashed. Rammed earth is not a cheap form of construction if labor cost is considered, but a rammed earth wall well built compares favorably with brick or other masonry for farm uses.

EMIGRANT INDUSTRIAL SAVINGS BANK

(Forty-third Street Facade)

NEW YORK CITY

VOORHEES, GMELIN AND WALKER,
ARCHITECTS

This remodeled bank building extends between two streets. On this side two old brownstone houses were torn down and the present two-story structure with limestone front on a granite base was erected.



Palmer Shannon

UNEMPLOYMENT RELIEF MEASURES

ARCHITECTS' EMERGENCY COMMITTEE FOR THE REGION OF NEW YORK

Original organization, composition and scope: Organized by twelve architectural organizations in November, 1930, and composed of one representative of each of those organizations and two representatives of the architectural press, as well as a paid executive secretary. The field of activity was solely that of

- A. Creating a registry office for the keeping of records of all registrants, giving complete information in regard to their experience and ability and confidential information in regard to their financial status.
- B. Seeking positions for these men in a manner not to supplant other workers and of a kind in which the education and training of the profession would be useful.

With the increase in unemployment and destitution the composition of the Committee had to be enlarged and its field of activity extended to include the raising and administration of funds.

Present composition: A General Committee with an executive committee and subcommittees.

General Committee: Representatives of the twelve organizations and the architectural press as above, with added members as vice-chairman and as members at large. Due to the difficulty of obtaining a quorum of so large a Committee at weekly meetings, the General Committee constituted an *executive committee*, composed of ten members, and *three committees*, likewise created to give more efficient handling of the committees' work:

1. Registration, classification and assignment.
2. Work finding.
3. Clearance and finance.

Present scope of the work of the Committee is as follows:

- (A) Registry of men with classification as to
 - (1) Ability and experience.
 - (2) Degree of need (including number of dependents).
 - (3) Positions and relief obtained through the Committee.
- (B) Seeking employment in
 - (1) Private positions in architects' and similar offices and in business enterprises.
 - (2) Positions at an emergency wage on funds subscribed by the public and disbursed through the Emergency Work Bureau (the disbursing agency for funds raised first by the Prosser Committee and then by the Gibson Committee).



Wide World Photos

Duncan Dancers at a garden fête given on estate of Samuel Untermyer, Graystone, New York, by Women's Division, Architects' Emergency Committee, to raise relief funds.

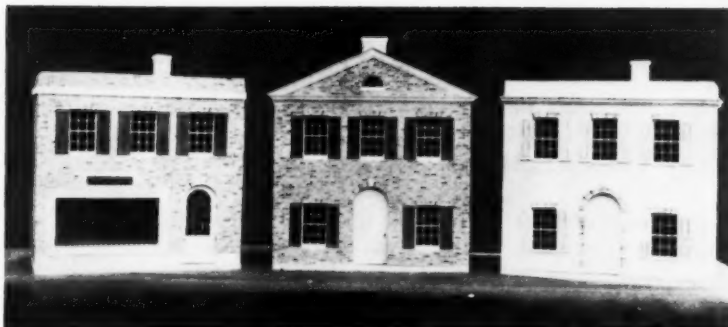
- (3) Positions at an emergency wage on funds collected by, or for, this Committee.
- (C) Finding or creating types of employment in B 2 and 3.
- (D) Holding competitions open to those registered and distributing large number of cash prizes.
- (E) Providing lodging, food, and clothing in most needy cases.
- (F) Giving small amount of cash relief in the most desperate cases.
- (G) Fund raising for
 - (1) The Committee's administration expenses.
 - (2) Relief work.

Results obtained up to November 1:

(A 1) 2,551 were registered of whom (A 2) practically all were in actual need; (A 3) 1,068 positions had been obtained as follows:

- (B 1) 340 in private employment.
- (B 2) 307 on emergency wage from the Emergency Work Bureau.
- (B 3) 421 on emergency wage paid by our fund.
- (C) The types of employments found or created for B 2 and 3 are:
 - (a) Small House Planning through the Architects' Small House Service Bureau.
 - (b) Housing studies, traffic survey, etc., for the Regional Plan.
 - (c) Slum statistics, charts, etc., for the State Housing Board and the New School of Social Research.
 - (d) Technocracy investigation at Columbia University under Prof. Rautenstrauch and Dr. Scott.
 - (e) Property survey for the West Side Association of Commerce.
 - (f) Work on Departmental Records for the Bureau of Buildings, Borough of Manhattan.

Approximately 300 doll houses have been built for the Christmas season by draftsmen in the firm of Delano and Aldrich as a new line of architectural activity. Several designs are available, three of which are shown here. The buildings are about 2 feet square in plan, are wired for electric lighting, and have removable fronts so that they may be equipped with miniature furniture. Prices range from \$10 to \$200, according to elaborateness of the doll houses.



- (g) Drafting for alterations and repairs, College of the City of New York.
- (h) Research work on theater construction for articles in the architectural magazines.
- (i) Drafting on working details for articles in the architectural magazines.
- (j) Study of Hillside Housing under Henry Wright.
- (k) Measuring and drawing of old buildings with a view to publication.
- (l) Investigation of building materials under F. L. Ackerman and Ely J. Kahn.
- (m) Housing charts under Clarence Stein, John Thompson, and Arthur Holden.
- (n) Installation work of benefit exhibitions.
- (o) Clerical work for Women's Division.
- (p) Clerical work for Architects' Emergency Committee.

(D) Five competitions have been held with a total of 134 cash prizes.

(E) This is accomplished by using the Architectural League facilities and by placing men in private families. A three-cornered arrangement has just been consummated between the Hudson Guild, the Emergency Work Bureau and this Committee for the lodging and feeding of thirty men until the spring at the Hudson Guild Farm, Hacktstown, N. J.

(F) Only forty cases were given cash relief when immediate employment could not be obtained.

(G 1) The Committee's administration expenses have been met by the contributions from most of the organizations that created the Architects' Emergency Committee. These expenses are printing, stationery, postage, telephone and Mrs. Nelson's salary. Other employees of the Committee's office are recruited from our unemployed list and are paid from the Emergency Fund. The Architectural League gives rent, light and heat free.

(G 2) The funds raised for the Emergency Fund for relief work are from two sources:

- (a) The architectural profession canvassed by this Committee direct.
- (b) The public through the efforts of the Women's Division by means of direct appeal, benefit performances, limited chair parties, exhibitions, and garden parties.

Julian Clarence Levi, Chairman.

NEW JERSEY CHAPTER, A.I.A.

The New Jersey Chapter is a part of the Architects' Emergency Committee of the Metropolitan District. There are so many architects and draftsmen who are employed in New York but live in New Jersey that we thought it unwise to start an independent move because of the overlapping of activities. Although we have a separate committee raising funds in Newark and vicinity we are turning in these funds to the general committee for distribution.

Wilson C. Ely, Chairman,
Relief Committee.

WESTCHESTER COUNTY SOCIETY OF ARCHITECTS, NEW YORK

We have established a permanent exhibition in cooperation with the J. A. Malhstedt Lumber and Coal Company of New Rochelle. A salesman is in charge and he has been successful in guiding considerable work to our members who are exhibitors.

This has been business which to a great extent has been created.

Our next meeting is to be devoted to cooperation of realtors, bankers, builders and material concerns in the building and financing of alterations, modernization and reconstruction generally.

Laurence M. Loeb, Secretary.



Another means of raising funds in New York—an Architects' Hobby Show. Decoy swans and ducks, a stuffed skunk in a cage, photographs, racing silks and toys were among the exhibits.

THE ARCHITECTS LEAGUE OF NORTHERN NEW JERSEY

The League cooperates with the Architects' Emergency Committee in New York City in direct relief work for our unemployed. There has been but little relief asked for on the part of our members although there is almost no architectural work to be had.

Just why or how we all continue to live is something of a mystery to me. Many have partially gone into other lines. One letters tombstones, another has opened a store, another sells insurance and others sell other things. Perhaps, as Mark Twain had it, we will make a living taking in each other's washing.

We all agree that the organization shall keep going and continue to grow. To that end we have cancelled all arrears in dues and have entirely eliminated initiation fees and future dues. Our small expenses will be met by voluntary annual subscriptions of two dollars from those who are able to so give. Thus every member is now and always in good standing and new members are coming in.

Clarence Tabor, Secretary.

EMERGENCY PLANNING AND RESEARCH BUREAU, INC.

(Sponsored Jointly by the Boston Society of Architects and the Engineering Societies of Boston, Inc.) The general comment of those who have examined the work of the Emergency Planning and Research Bureau, Inc., has been that money contributed for such a purpose has seldom been so effectively used. This, because the money has been paid to those who genuinely and unmistakably need it, both for support and for the added self-respect which a job gives. On the practical side, the work accomplished by these men has been a demonstration to this community of the value of engineering and architectural research.

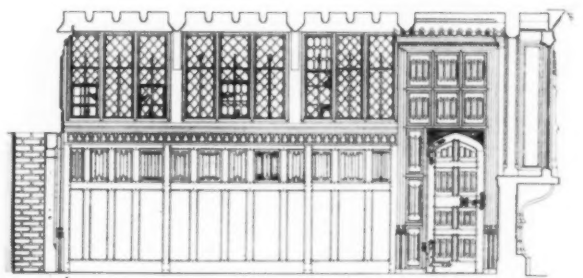
First, as to how the funds have been handled: The Architectural Division raised about 30 per cent of the funds and the Engineering Division about 70 per cent. The two divisions have worked in close cooperation. Out of 1,637 applicants, 406 have been directly employed by the Bureau, and positions have been obtained for 171 others. The peak of employment was last April, when the pay roll for 240 men was \$3,600 per week.

Because of limited funds, it is possible to help only the most needy and deserving cases. Each application is investigated through local welfare boards as well as through representatives of the applicant's architectural or engineering society group. There are so many that it is necessary to use the utmost diligence in determining who should have help and who cannot be helped.

The funds of the Bureau are handled under close budgetary control. All payments are made by check. The accounts are audited, and forecasts made as to income and expenditure. Working quarters and office furniture have been provided without cost to the Bureau. Drafting materials, postage, telephone, and all other items commonly



Tudor Room from Somersetshire, England, in Boston Museum of Fine Arts.



A measured drawing of the Tudor Room in the Boston Museum by the Emergency Planning and Research Bureau.

grouped as "overhead" have been held to the astonishingly low figure of 3.6 per cent for the Engineering Division and 3.8 per cent for the Architectural Division. Accordingly, out of each dollar spent, ninety-six and a fraction cents is pay roll.

Second, as to the work which has been done: Without competing in any way with the work of architectural and engineering firms, the Bureau has assembled a classified mass of information. Long needed maps, for which funds have never been available, have been made for state institutions. Over \$11,000 has been spent on these, for work which would have required about \$56,000 of appropriation. Housing conditions, valuations, and rehabilitations have been studied. Plans have been prepared showing streets and properties by types which will be turned over to the City Planning Board. For the City to have made these plans would have cost about \$55,000. Facts, otherwise unavailable, have been tabulated and graphed. More information has been developed by the Bureau in connection with the Metropolitan Area than has ever before been assembled in one place. All this work has been done under competent direction. The community has the benefit of technical work for which contributions of over \$75,000 have been expended to date.

The Bureau is well along on the assembly of the basic data for a Metropolitan study and plan, a project on which Philadelphia spent about \$750,000.

The Bureau has supplied men to aid in the organization of the Job Finding Campaign and has received substantial contributions from the Allocation Committee of the United Unemployment Relief Campaign.

Faced with the probability of a continued shortage of employment through the coming winter months, and to conserve funds, the Bureau has of late found it necessary to reduce the rate of expenditure. The number of employees has been reduced to about 170 and the men have been put on part time during the summer. The average weekly pay, which was originally \$15, has now been reduced to about \$10. Even on this basis, however, the funds of the Bureau are getting low, and the present rate of pay is inadequate for cold weather living expenses. At the same time, the Bureau's opportunity for useful work has never been so great as it is now.

William Stanley Parker, President.

T-SQUARE CLUB OF PHILADELPHIA

Relief work has been handled by the Philadelphia Chapter, A.I.A., many of whose members are also members of the T-Square Club. The Club has collaborated, but has done no independent work in this line.

Albert R. Ware, Secretary.

PHILADELPHIA CHAPTER, A.I.A.

This chapter started raising funds early in 1931 for the relief of unemployed draftsmen and their families. We continued this service over a period of about 18 months, during which we raised the sum of approximately \$16,000 and gave employment to a total of 57 draftsmen. We divided the men into four classes in accordance with their responsibilities and dependencies. Married men with children and few resources were given five days a week, whereas single men with no particular responsibilities were given one day of work a week; the others being classified somewhere between in accordance with their responsibilities. Each man was paid at the rate of \$4 a day. As conditions grew more serious and funds were diminishing only the men who had been classified as "A" and "B" were retained and their wages were reduced to \$15 a week.

Under the guidance of practicing architects these men made measured drawings of the historically and architecturally important buildings in the old section of the city. A total of 407 measured drawings of uniform size were completed. We are about to publish a book covering this work, the proceeds of which will be for their benefit.

At the present writing this activity is at a standstill due to the lack of funds but we are considering ways and means of reviving the work.

Sydney E. Martin, Chairman,
Relief Committee.

PITTSBURGH CHAPTER, A.I.A.

There has been no activity in the profession on an organized scale dealing with the relief of unemployment. However, plans are now going ahead for such work and a committee has just been formed to investigate the feasibility of various schemes under consideration.

Charles M. Stotz, Secretary.

FLORIDA SOUTH CHAPTER, A.I.A.

There have been no organized efforts in this locality to aid architects or draftsmen in distress.

Many architects have done what they could to help the men formerly employed by them. Some have arranged to have draftsmen employed as unskilled labor on the jobs. This worked sometimes with success where the men had strong backs. Some draftsmen are being carried along at very low wages where the architect feels he can afford to have some one busy on promotional work.

Russell T. Pancoast, President.

Because of the serious setback two years before the crash happened in the North, both architects and draftsmen migrated back to the North. Consequently the number of architects and draftsmen in any particular district in Florida is much smaller than normal. Miami probably has still the largest number of architects and draftsmen in the State but at this time there are only about 50 practicing architects in the district, and architectural draftsmen are probably at this time not more than a dozen.

So far no immediate necessity to assist anybody in the architectural profession has occurred, but if this condition continues much longer something will have to be done.

Richard Kiehnel.

VIRGINIA CHAPTER, A.I.A.

The architects in Virginia have felt the depression and felt it keenly, but we have not had conditions to face like those of the more populous and concentrated areas. We have not had to raise relief funds but have lent our efforts toward getting more work for the architects by indorsing the Institute's program to have the Government employ private architects on Federal buildings. This effort, we are glad to say, has been successful in certain instances, but private architects have not been employed on anything like the number of Federal projects that they should be.

The Chapter has made every effort to curtail the activities of the Architects' Office of the State Board of Education and we feel, to a marked degree, that this has been successful. This work will afford more employment for the different architects throughout the state.

We have had distributed to all the membership pamphlets from the Reconstruction Finance Corporation stating what projects are acceptable and how applications should be filed for loans from this corporation. We have also had distributed to all of the membership notices of the proposed

Federal work authorized in the state showing appropriation and location in order that our architects might apply to the different Federal Bureaus for commissions.

Notwithstanding the fact that it has not been necessary to adopt any direct relief measures, this Chapter has made every effort to inform its membership of every activity in the building industry. Even though finances are at a low ebb, it has redoubled its efforts in endeavoring to send to its membership practical information.

P. S. Clark, Secretary-Treasurer.

CLEVELAND CHAPTER, A.I.A.

Our committee was appointed by Philip Small, former president of the Chapter, last spring and reappointed by Abram Garfield, who was elected president in September. We were at once confronted with cases requiring immediate relief and we therefore obtained a few direct contributions from organizations affiliated with the building industry. Our next effort was directed toward a benefit moving picture show on which we netted approximately \$800.

A survey which we were conducting in the meantime disclosed that there were approximately 150 unemployed architects and draftsmen in the Cleveland district, 42 of whom were men with families in need of help. A subcommittee was formed to interview applicants for relief personally and to determine disbursements in accordance with the degree of need.

We then determined to hold bi-monthly competitions sponsored by various manufacturers and material firms which applicants for relief would be required to enter. These competitions cost the sponsors \$150, \$100 of which was set aside for prizes and \$50 of which was assigned to our general fund for disbursement by our Committee in accordance with the degree of need. After holding ten such competitions and receiving assurances from all the sponsors that they had received more in value than the cost of sponsoring the competition, we raised the price to \$250, setting aside \$150 for prize money and assigning \$100 to our general fund. Even at this price the competitions have become so popular among manufacturers and material firms that it now appears we will be able to secure sufficient sponsors to conduct weekly competitions, thus realizing an income of \$1,000 a month.

The subjects for competitions have been sufficiently varied so that the award of prizes has been widely distributed; to illustrate, the following subjects have been included: The Design of an Elevator Car; A Description of a Sprinkler System; A Small Brick House; A Display Advertisement for a Chain of Hotels; A Design for Hardware; A Christmas Card.

Each prospective sponsor is cautioned that we do not want the proposition considered on the basis of charity or good will but merely want him to

decide whether or not he will receive in the value of the ideas suggested more than the cost of the competition and by permitting him to check the results obtained by previous sponsors we are having progressively less difficulty in obtaining new sponsors.

A. C. Robinson, Secretary.
Relief Committee.

TOLEDO CHAPTER, A.I.A.

We have not noticed any particular need for help among the profession. Every one here needs about as much help as every one else, and we all seem to be existing and that is about all.

Karl B. Hoke, Secretary.

MICHIGAN SOCIETY OF ARCHITECTS

This year Mr. Branson V. Gamber, president of the Detroit Chapter, appointed Mr. David H. Williams, Jr., chairman of a relief committee to raise funds for architectural draftsmen in distress.

Mr. Williams, by soliciting architects, raised about \$1,100, most of which was from five or six of the larger offices. There were also other pledges, mostly from smaller offices, which were not paid.

With this limited budget, naturally the problem became one of finding draftsmen in greatest need. These men were furnished coal and groceries, and in some cases were advanced money, not exceeding \$25 per month. These advances were understood to be loans, since it was found that draftsmen were not inclined as a rule to accept charity, whatever their plight.

Mr. Williams had planned to have the men earn the amounts, but as the fund became exhausted no scheme was finally put into execution. It was his suggestion, however, that the men be given drafting on standard details such as have been evolved in different offices. By pooling together ideas from these individual offices, blue prints of useful detail would become available to all the offices. Another idea was to prepare designs for small houses which might be sold to publications.

The Michigan Society of Architects, through the office of the *Weekly Bulletin*, has maintained for a number of years a placement service for draftsmen. In normal times it has been most effective in forming contacts between offices and draftsmen. Even in these times there are occasional calls, chiefly from manufacturing companies and similar organizations who are in need of architectural men.

Aside from these activities the only other endeavor has been a Demonstration House in Grand Circus Park, downtown Detroit, which was described by G. Frank Corder in a recent issue of the *American Architect*.

The highlights are as follows:

The Detroit Building Congress early in 1932 undertook a modernizing campaign which had previously been sponsored by the Detroit Board of Commerce as an annual event in connection with the national "Clean-up, Fix-up" campaign originated by the real estate boards. This campaign

By reason of its being a civic enterprise to create employment, everything was donated. A 60-year-old house was moved into the park and publicly modernized. Many inquiries resulted from persons who wanted improvements made on their own buildings. Most of these, ranging from a dormer to a complete remodeling of a four-story building, means employment for craftsmen and the sale of some materials. Draftsmen and architects took turns serving as "Architect in Charge" and as such were permitted to take as their own prospects the names of those who needed any drafting, architectural advice or other service. In this way the man who served a four-hour period almost invariably went away with a number of names of prospects, which resulted in considerable employment particularly for minor drafting jobs.

CHICAGO ARCHITECTS' RELIEF FUND

On September 30 a "Latin Quarter Fête"—with costumed guests, artists and models, Paris street scenes, side shows and reproductions of famous cafés—was held at the Drake Hotel to raise funds for the aid of some 1,200 unemployed draftsmen. With limited invitations and an admission fee of \$5 a person, the *fête* was attended by 2,500 Chicagoans, according to reports.

A group of architects organized and staged the party, with A. N. Rebori as chairman of the executive committee. The purpose of the festival is expressed in the following paragraphs which appeared in an elaborate program published for the occasion:

"The sympathetic look, the extended credit, the moratorium at the club has made it evident to us architects that the world is not unaware of the desperate plight in which our beloved art and its disciples find themselves today. Never in the history of our country has there been such an utter paralysis in building. We architects in some way that we scarcely understand ourselves have been able to carry on. Perhaps it has been by the force of precedent which it has been said has always been the architect's best friend; but the draftsmen and the superintendents, the men on whom we have depended to make our dreams realities, have no such back-log, either material or spiritual. They are either sticking by the noblest of the professions and starving or else eking out a livelihood in other more remunerative callings. Right now, unless he has recently lost his job, a winner of one of America's greatest architectural scholarships—a cachet of extraordinary ability—is washing dishes in a restaurant!

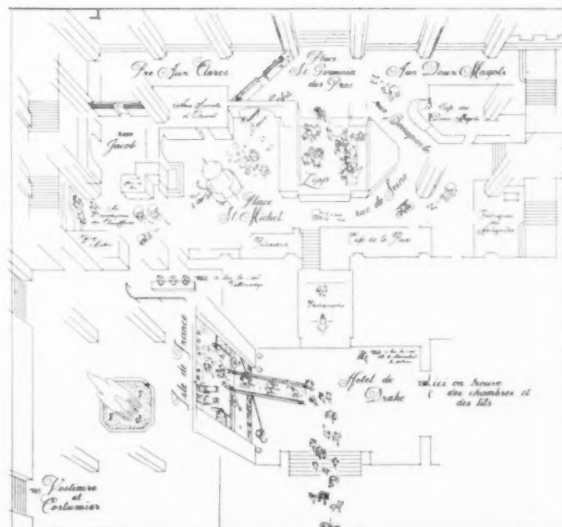
"We and you cannot afford to let these men suffer either on humanitarian or selfish grounds and we must not let architecture suffer by their loss. Building will revive. Architecture will cast

off her sackcloth and shake the ashes from her locks and when she does she must find her children about her. This *fête* is being held first, to assist architectural draftsmen and, sad as it is to admit, some architects who are in actual want, and second, to provide them work, thereby sustaining their morale and keeping them in the fold. The elaborate setting of this *mise en scène* and its seeming extravagance have had this very purpose in view. Every one employed upon it, with rare exceptions, has been an architectural draftsman who has been long out of work and were it not for these houses of canvas and paint, would be unemployed now. They have been paid out of the fund that you have so generously augmented tonight, a fund the nest egg of which was laid last spring in a series of inter-professional parties. One architect gives a party, you know, at \$2 a head and then all the guests are supposed to do the same—very complicated and exhausting but still productive of \$700. The noble traditions of architecture were upheld much better in the delightful tea given by Mrs. James Thorne at which her beautiful and very professional interiors *en miniature* were exhibited. This netted another \$1,000.

"Exactly how the money accruing from the Latin Quarter Fête will be expended has not been determined—some of it by direct relief certainly, and the major part, perhaps, in employing the unemployed to develop plans for the improvement of blighted areas or other projects for the public weal.

"Architecture, the mother of the arts, at least for tonight, is no *mater dolorosa*. She is all smiles and gratitude. 'Un mille remerciements,' she cries, 'Allons, mes enfants! Amusez vous bien.'

"This party may end the depression. Who knows?"



The Drake Hotel in Chicago was revamped into the Latin Quarter of Paris, as shown in this plan, for the fund-raising fête given by the Chicago Architects' Relief Committee.

SAINT LOUIS ARCHITECTURAL CLUB

We have not been able to do any more for the relief of unemployed draftsmen than to continue our free employment bureau. All of the Club's funds have been used to keep the property intact and to continue the meetings. We are carrying a large number of members who have not been able to pay any dues for almost two years.

John A. Bryan, who is actively interested in the preservation of historic buildings, has been able to arouse some financial interest in such projects. While this work provides no employment for draftsmen, it does help the building trades to some extent. Mr. Bryan is also a member of the Committee on Preservation of Historic Buildings in the St. Louis Chapter, American Institute of Architects, so there is no duplication of effort by the two architectural societies.

Herbert Reinhardt, President.

ST. LOUIS CHAPTER, A.I.A.

This Chapter has made no special effort to relieve unemployment among draftsmen, nor has any special activity been arranged.

P. John Hoener, Secretary.

KANSAS CHAPTER, A.I.A.

Practically all architects and draftsmen within our State need some relief. There has not been any organized activity toward relief work. The architects in the Kansas Chapter are of course comparatively widely scattered over the State and are rather few in number, which makes work of this type difficult.

Geo. M. Beal, Secretary.

WISCONSIN CHAPTER, A.I.A.

This Chapter has not done anything along relief lines. While there has been unemployment, conditions financially have not been as acute as they probably are in a city like New York. Most of our men have been able to place themselves in other activities. I dare say that if the entire situation were combed, relatively few would be found really up against it.

There is one thing that the Chapter has done, however, which may be of interest. We have a lot of junior draftsmen here in Milwaukee. Most of them are young unmarried men who are still living at home with their parents. Time has been on their hands so the Chapter has chosen to finance their studies. An atelier has been formed with a number of architects in charge and Beaux Arts work has been undertaken. The Chapter is assuming the entire expenses of this enterprise. We have approximately 20 men entered in the work and from the way the thing is going there is no doubt it will be a huge and popular success. It keeps the boys busy. Likewise they are advancing in their studies which makes it worthwhile.

Alexander C. Guth, Secretary.

WEST TEXAS CHAPTER, A.I.A.

This Chapter has not inaugurated, up to the present time, any activity to provide work or relief for unemployed architects or draftsmen. I think, however, that the Chapter will start a program in the very near future, but at this time I am not able to state along what lines activity will be directed.

Richard Vander Straten, Secretary-Treasurer.

STATE ASSOCIATION OF CALIFORNIA ARCHITECTS, SOUTHERN SECTION

There has not been anything done along lines of providing work or relief for unemployed architects and draftsmen.

Lester H. Hibbard, Secretary.

SOUTHERN CALIFORNIA CHAPTER, A.I.A.

This Chapter has not taken any group action to provide work or relief. However, the individual architects are doing whatever they personally can to assist those who are in need.

Palmer Sabin, Secretary.

NORTHERN CALIFORNIA CHAPTER, A.I.A.

Some time ago a group of about twenty-five leading architects held a conference in which it was agreed to split employment as much as possible.

As a direct measure, the State Association of California Architects established an unemployment bureau for draftsmen.

James H. Mitchell, Secretary.

OREGON CHAPTER, A.I.A.

Our Chapter members are taking care of themselves as best they can. Chapter dues have been abolished for a year, and at a recent meeting the Executive Committee was authorized to assist needy architects and draftsmen, drawing on our already depleted bank account.

W. H. Crowell, Secretary.

TACOMA SOCIETY OF ARCHITECTS, WASHINGTON

This Society has not attempted anything along relief lines. It has fostered sketching and study classes among the draftsmen, however.

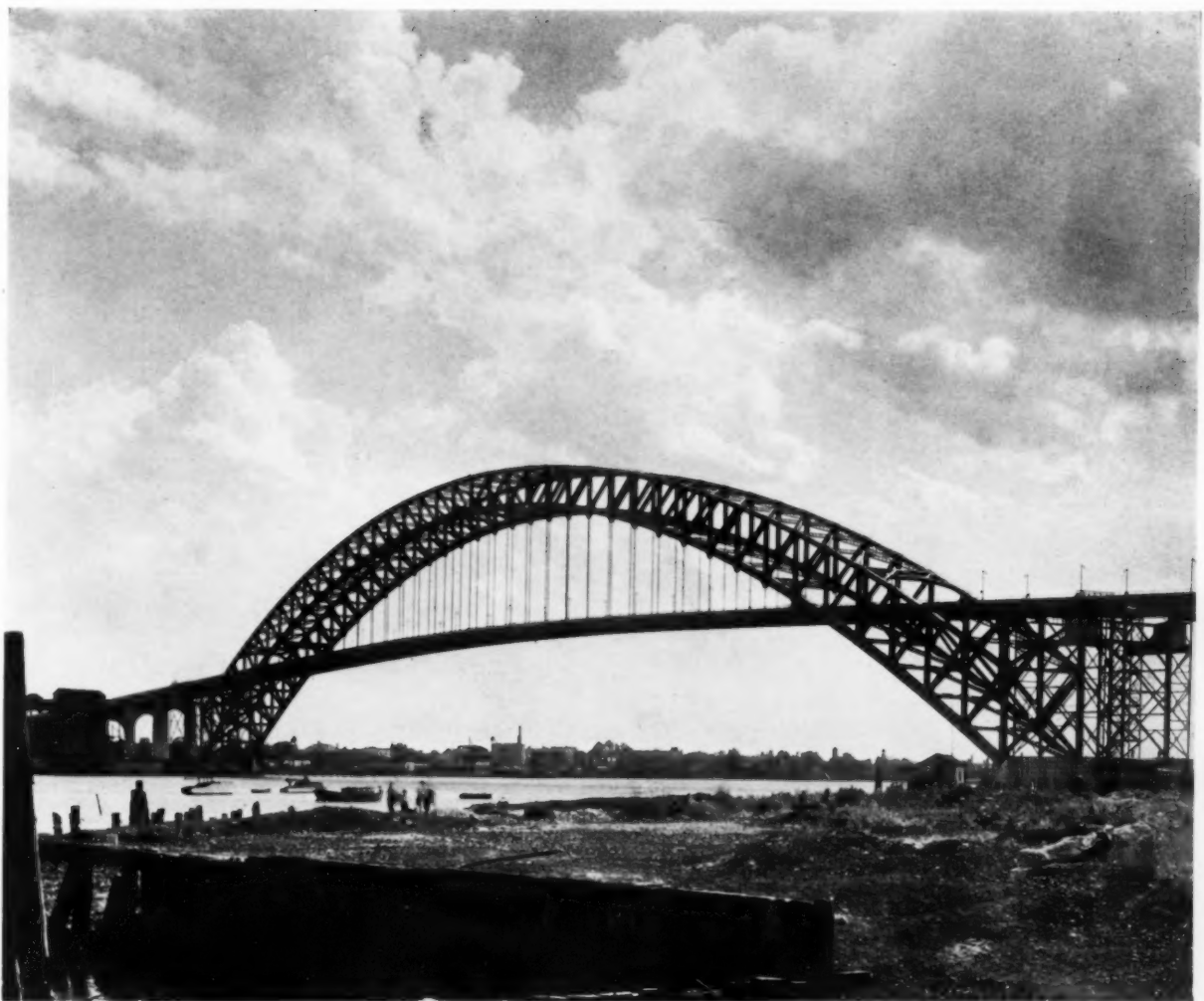
E. T. Mock, President.

MONTANA CHAPTER, A.I.A.

Nothing has been done by this Chapter towards providing relief or work for unemployed draftsmen. Many of the architects are in as much need of relief as some of the draftsmen. There is no business in the architectural line of any sort in Montana. As far as I know there is not a single job in any office in the State and very little prospect of any. Montana is not a State of large offices and there are perhaps as many architects in the State as there are draftsmen. So the problem of relief with us is not similar to that in the cities.

W. R. Plew, Professor of Architecture.

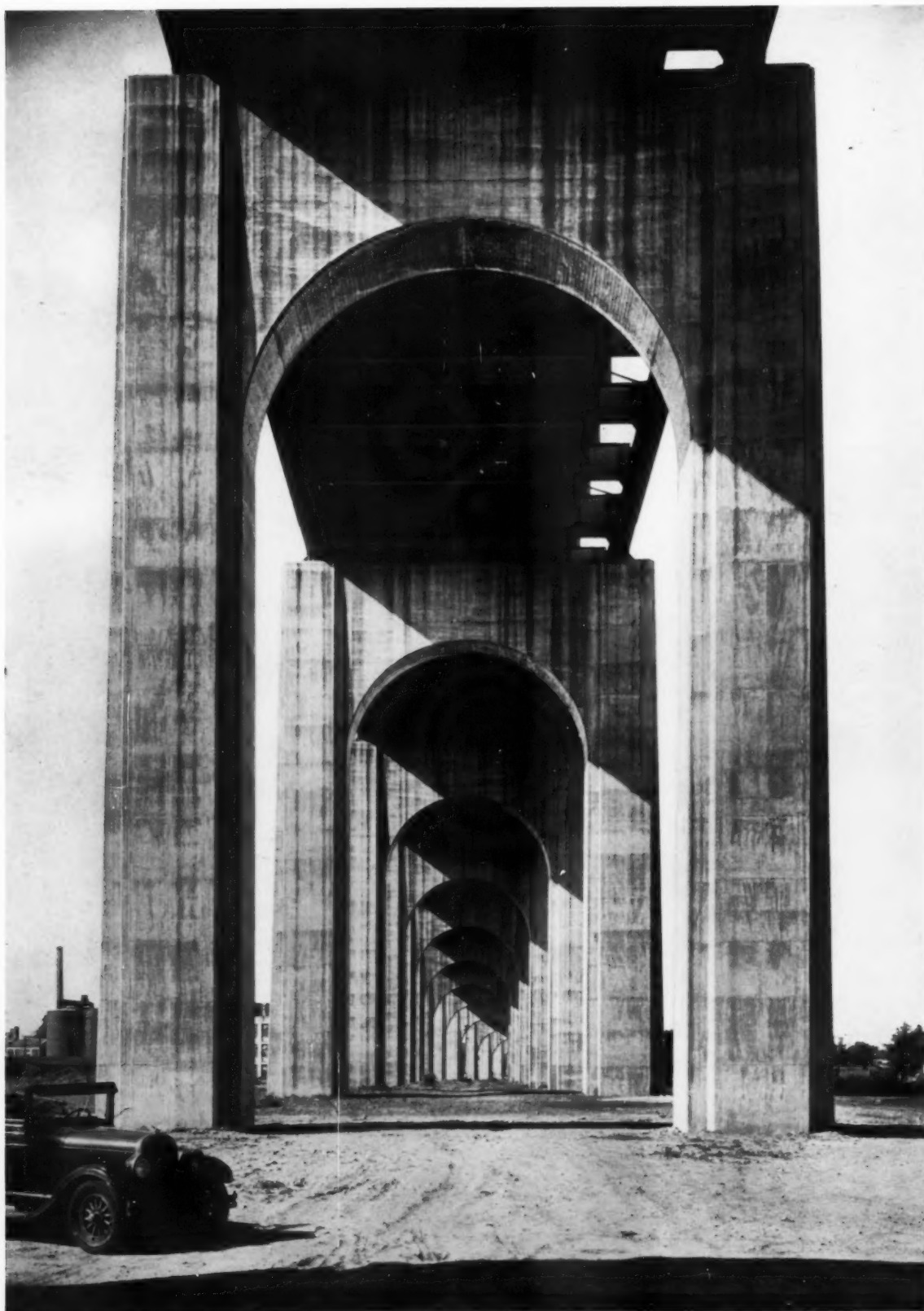
PORTFOLIO of CURRENT ARCHITECTURE



F. S. Lincoln

BAYONNE BRIDGE OVER KILL VAN KULL

This structure, which spans the Kill van Kull between Bayonne, New Jersey, and Staten Island, New York, was selected by the American Institute of Steel Construction as the most beautiful bridge costing in excess of one million dollars and opened to traffic in 1931. The main span is 1,675 feet. The bridge was designed by O. H. Ammann, Chief Engineer for the Port of New York Authority, with Cass Gilbert as consulting architect for the approaches.



F. S. Lincoln

BRIDGE OVER KILL VAN KULL
BETWEEN BAYONNE, N. J., AND STATEN ISLAND
O. H. AMMANN, CHIEF ENGINEER



F. S. Lincoln

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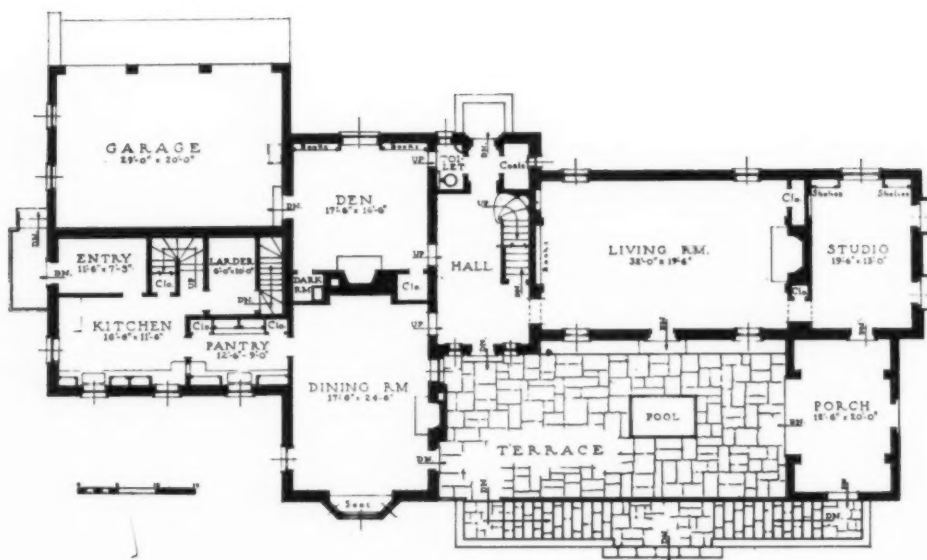


F. S. Lincoln

BRIDGE OVER KILL VAN KULL
BETWEEN BAYONNE, N. J., AND STATEN ISLAND
O. H. AMMANN, CHIEF ENGINEER



Stowell



Ground Floor Plan

HOUSE OF MR. AND MRS. L. C. STRONG
WASHINGTON, D. C.
WALDRON C. FAULKNER, ARCHITECT
NORMAN T. NEWTON, LANDSCAPE ARCHITECT



Stowell

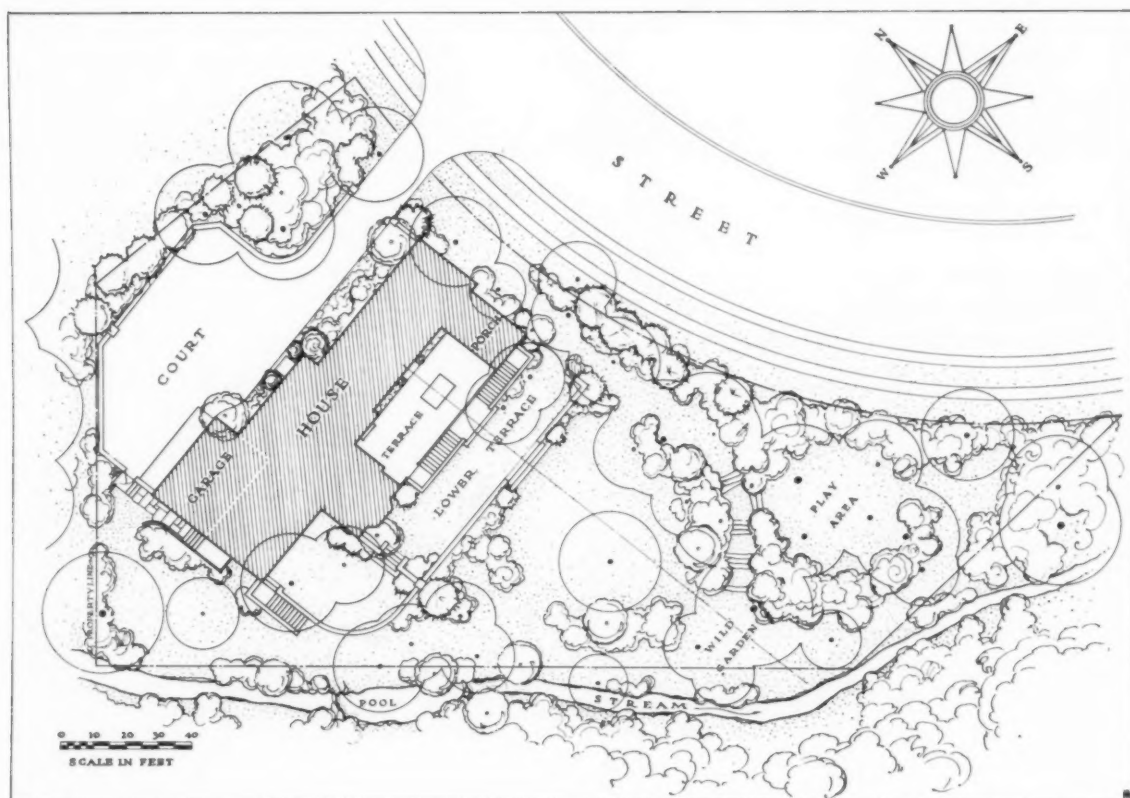


Second Floor Plan

HOUSE OF MR. AND MRS. L. C. STRONG
WASHINGTON, D. C.
WALDRON C. FAULKNER, ARCHITECT
NORMAN T. NEWTON, LANDSCAPE ARCHITECT



Stowell

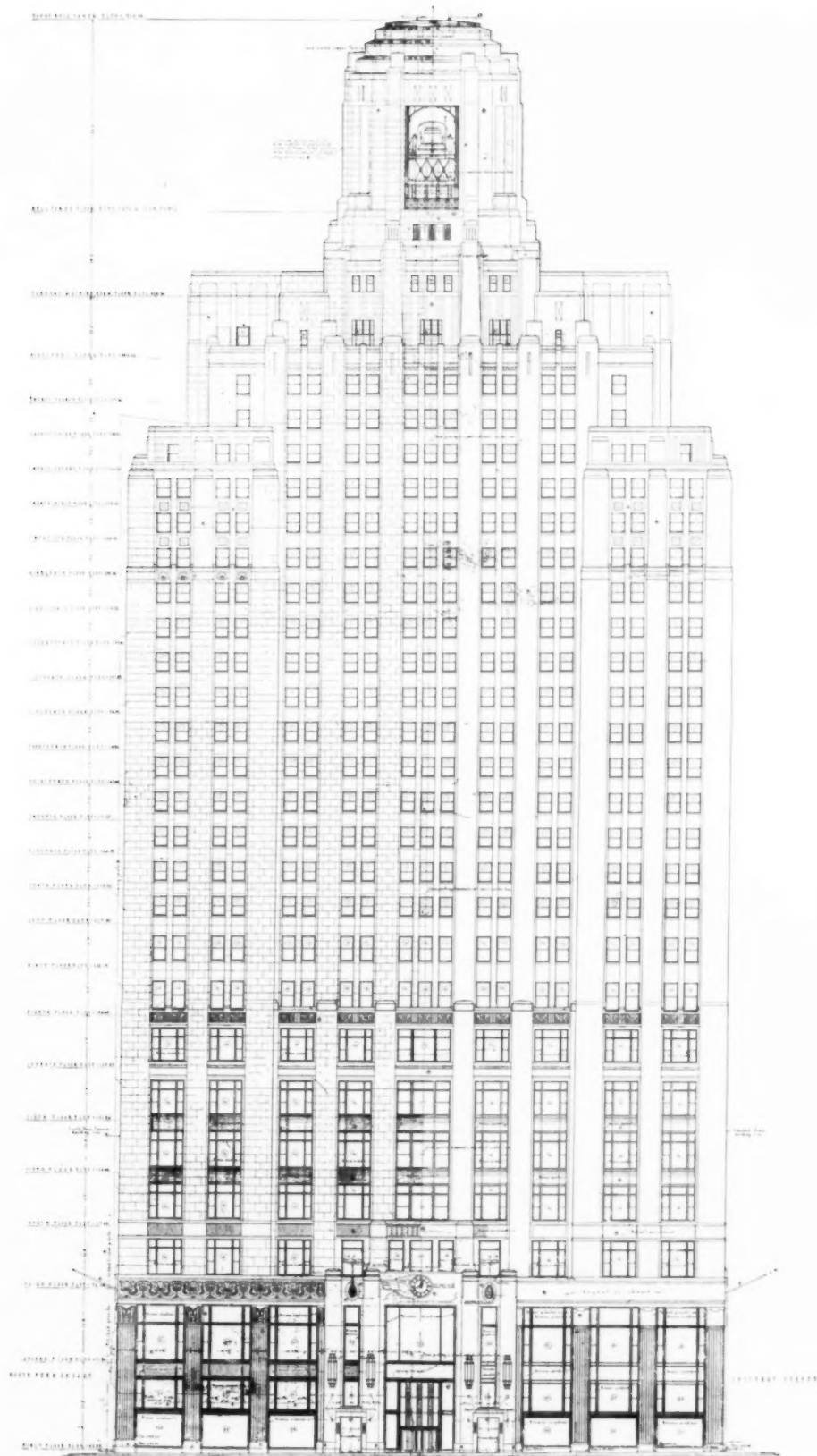


HOUSE OF MR. AND MRS. L. C. STRONG
WASHINGTON, D. C.
WALDRON C. FAULKNER, ARCHITECT
NORMAN T. NEWTON, LANDSCAPE ARCHITECT



The lower eight floors of this 26-story building are occupied by the new Wanamaker Men's Store. Upper floors are used as office space and are served by elevators entirely separated from the store elevators.

LINCOLN-LIBERTY BUILDING
1 BROAD STREET, PHILADELPHIA
JOHN T. WINDRIM, ARCHITECT



Working drawing of elevation.

LINCOLN-LIBERTY BUILDING
1 BROAD STREET, PHILADELPHIA
JOHN T. WINDRIM, ARCHITECT



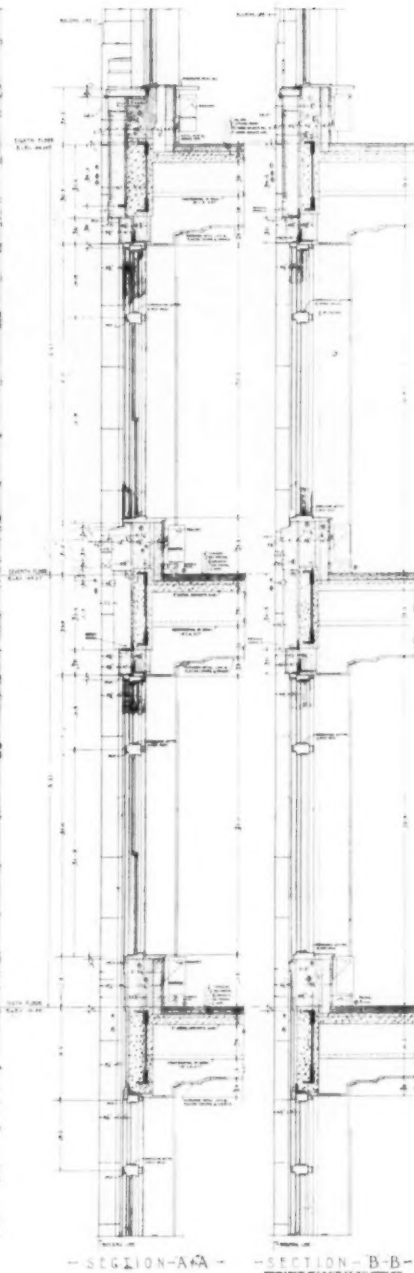
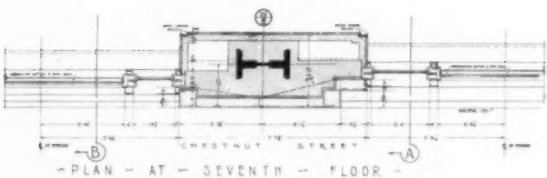
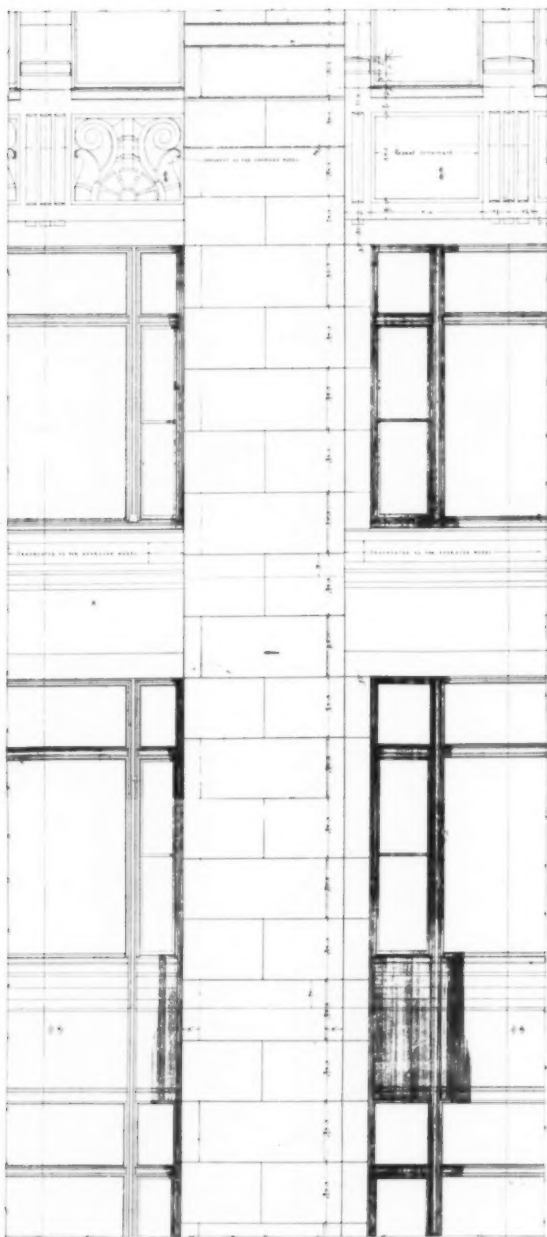
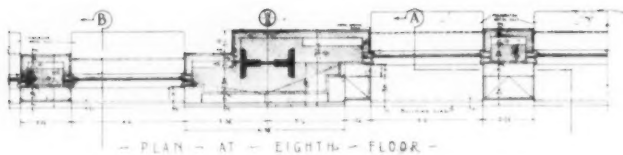
The building is faced with granite. Bronze entrances and windows below seventh floor; aluminum windows above.

LINCOLN-LIBERTY BUILDING
1 BROAD STREET, PHILADELPHIA
JOHN T. WINDRIM, ARCHITECT



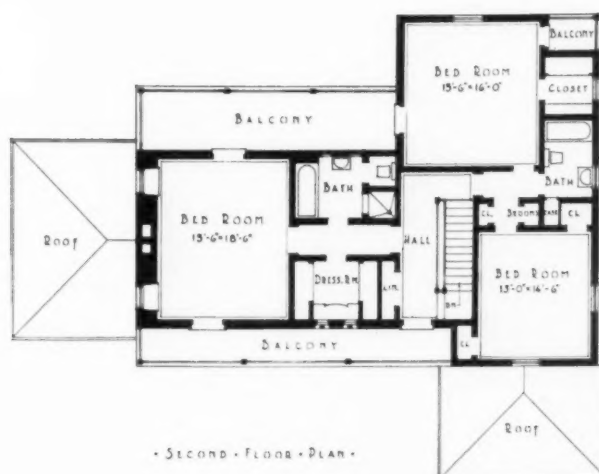
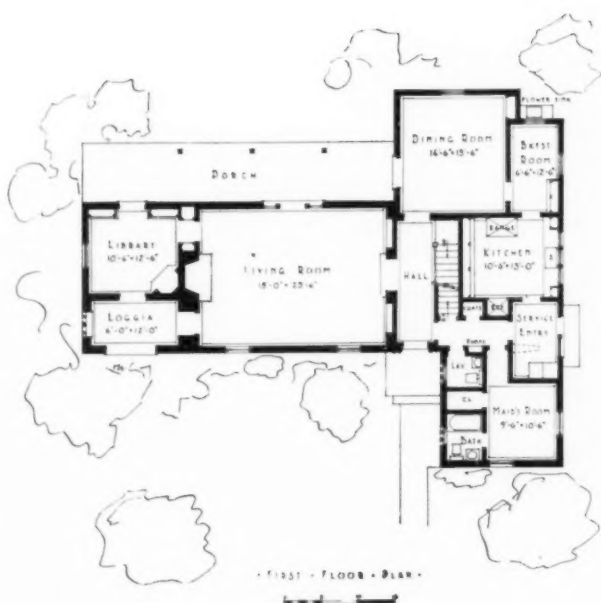
Murals by O. D. V. Guillonnet, French artist.

LINCOLN-LIBERTY BUILDING
1 BROAD STREET, PHILADELPHIA
JOHN T. WINDRIM, ARCHITECT



Typical details of windows.

LINCOLN-LIBERTY BUILDING
1 BROAD STREET, PHILADELPHIA
JOHN T. WINDRIM, ARCHITECT



HOUSE OF CLARENCE P. DAY
SAN MARINO, CALIFORNIA
H. ROY KELLEY, ARCHITECT



HOUSE OF CLARENCE P. DAY
SAN MARINO, CALIFORNIA
H. ROY KELLEY, ARCHITECT



HOUSE OF CLARENCE P. DAY
SAN MARINO, CALIFORNIA
H. ROY KELLEY, ARCHITECT



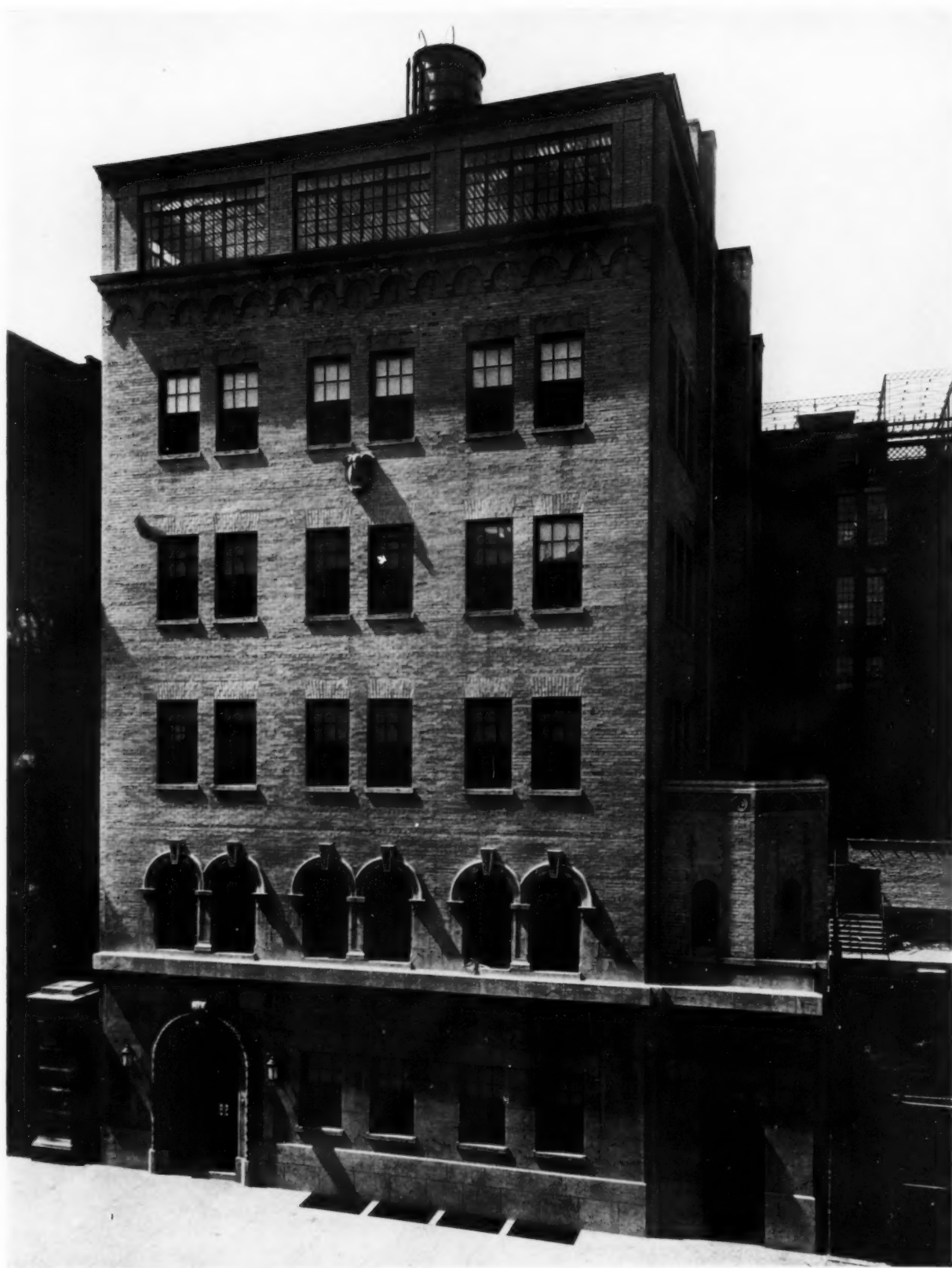
Stanfield Studio



Right: Ground Floor Plan

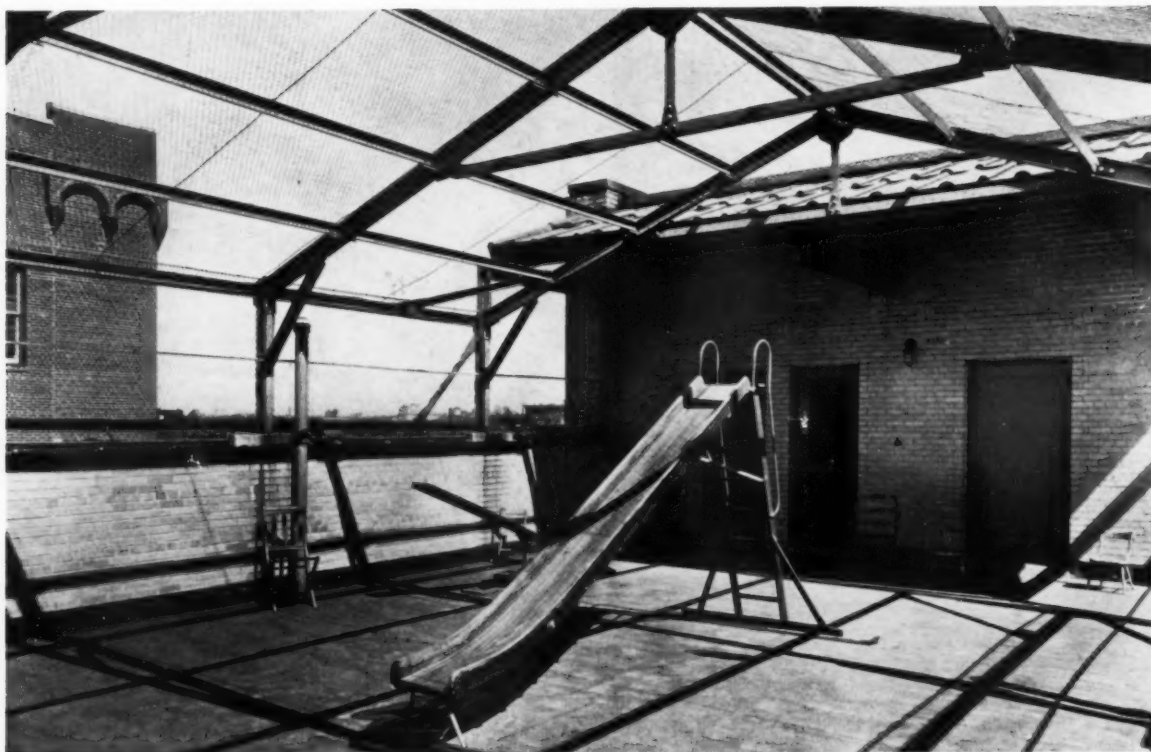


HOUSE OF S. B. BOYER
ATHENS, TENNESSEE
BARBER AND McMURRY, ARCHITECTS



Guild

McMAHON SHELTER
NEW YORK CITY
W. WHITEHILL, ARCHITECT



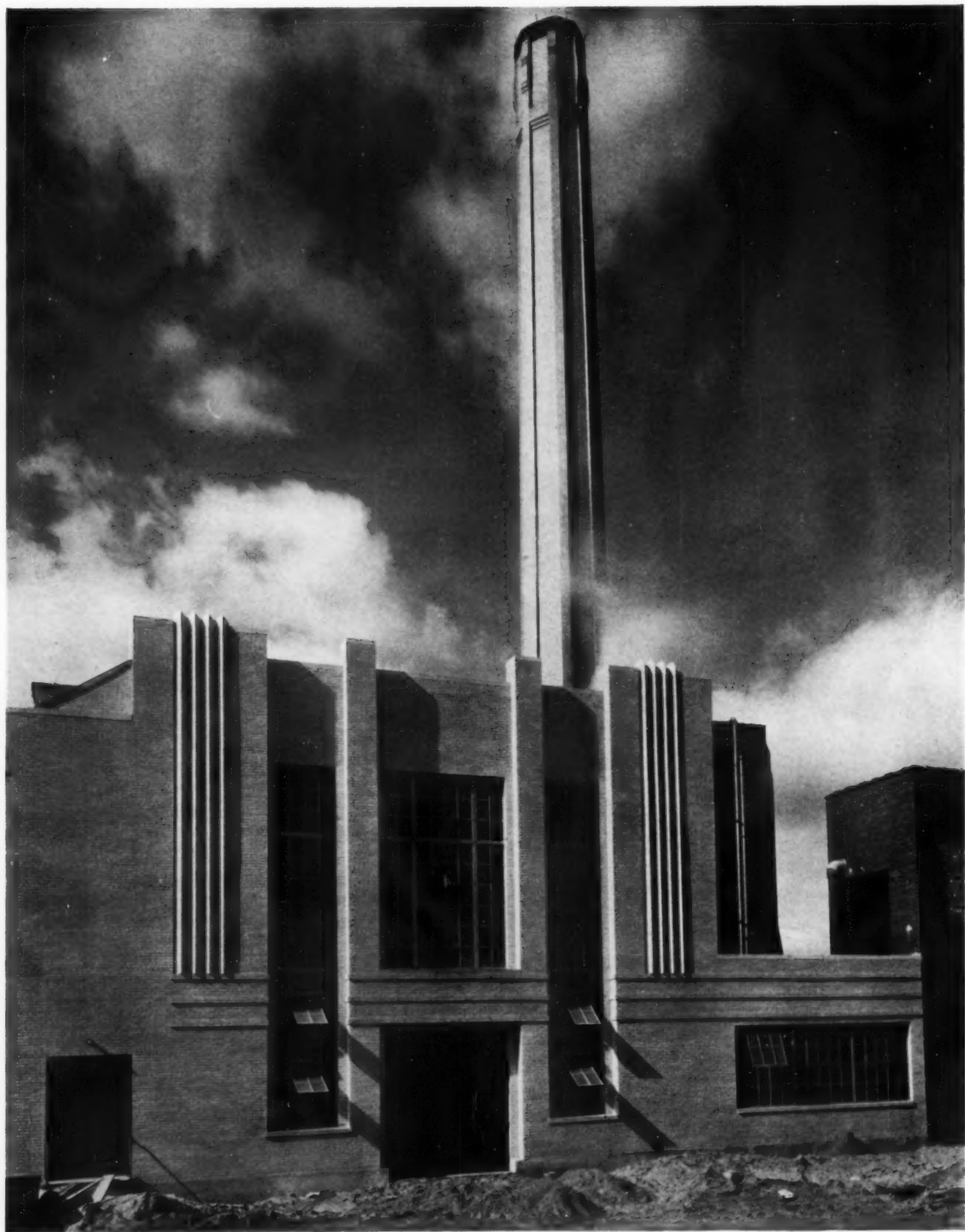
Guild

McMAHON SHELTER
NEW YORK CITY
W. WHITEHILL, ARCHITECT



Akron

KNICKERBOCKER LAUNDRY CO. PLANT
LONG ISLAND CITY, NEW YORK
IRVING M. FENICHEL, ARCHITECT



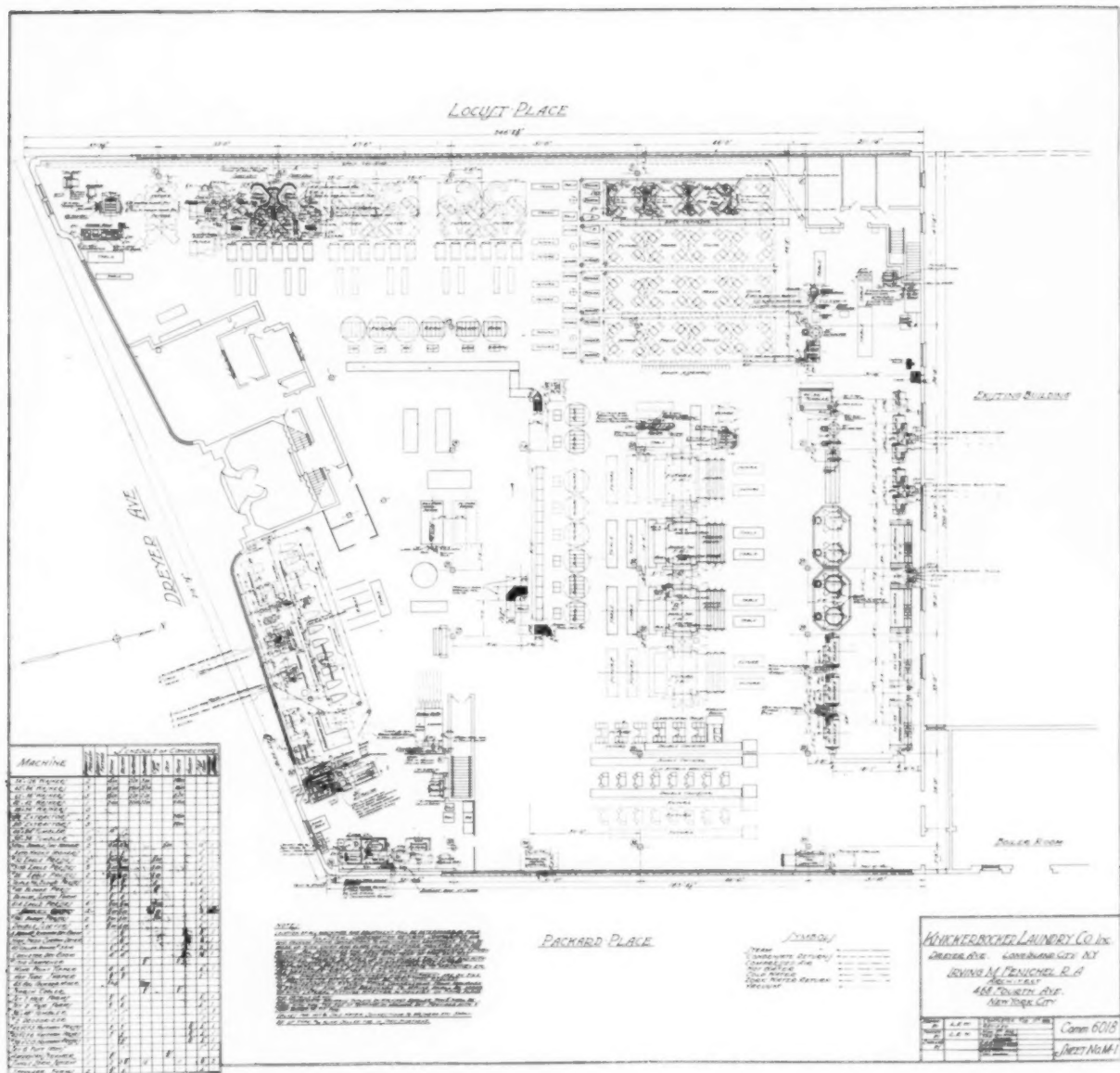
Akron

KNICKERBOCKER LAUNDRY CO. PLANT
LONG ISLAND CITY, NEW YORK
IRVING M. FENICHEL, ARCHITECT



Akron

KNICKERBOCKER LAUNDRY CO. PLANT
LONG ISLAND CITY, NEW YORK
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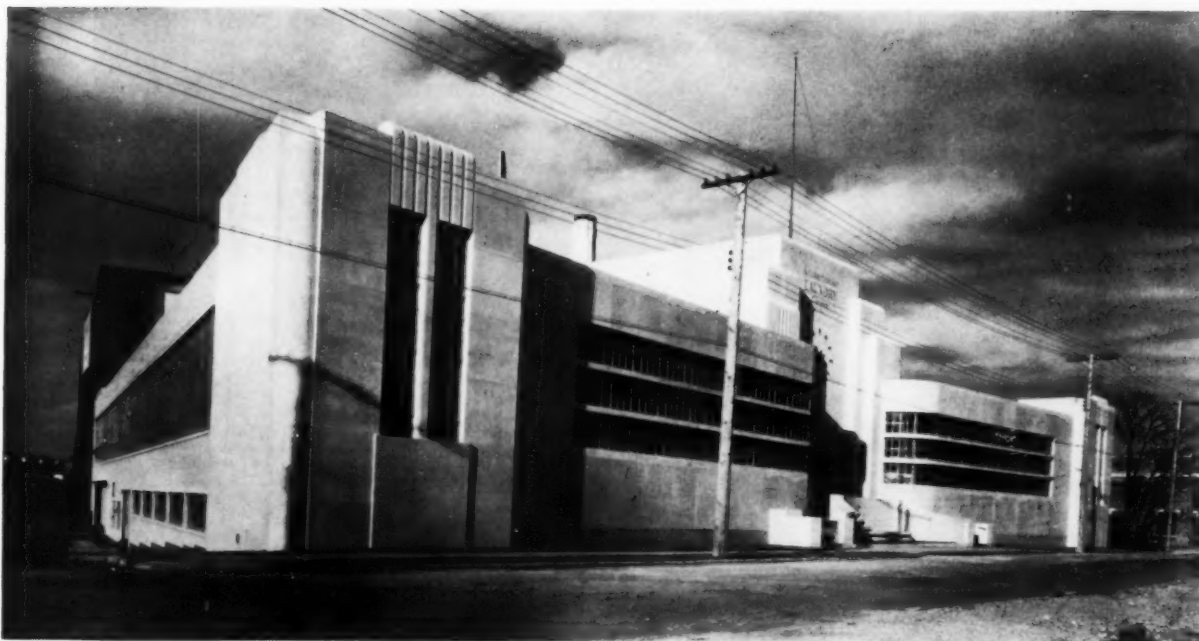


Akron

Entrance Lobby

Second floor plan, showing machinery layout and piping.

KNICKERBOCKER LAUNDRY CO. PLANT
 LONG ISLAND CITY, NEW YORK
 IRVING M. FENICHEL, ARCHITECT



Akron

General view of laundry plant.

KNICKERBOCKER LAUNDRY COMPANY PLANT

By IRVING M. FENICHEL, Architect

A program of augmentation has been effected during the past few years in the design of laundries through the adaptation of several allied cleaning departments. The progressive laundry owner now not only dry-cleans and dyes dresses and suits, but cleans and renovates carpets, rugs, curtains, blankets, gloves, stockings, hats, and the like.

Because of various urban ordinances governing the use of volatile inflammable liquids and limiting their usage to fireproof isolated buildings, the combination of laundry and dry-cleaning has been considered illogical. To overcome this barrier, manufacturers of laundry and dry-cleaning equipment, after many years of intensive experimentation, have perfected recently equipment designed to dry-clean garments with noninflammable liquid. The laundry designing architect is therefore now confronted with the complex problem of many new requisites.

Location

The location of a proposed plant is almost invariably the factor of prime importance in determining the type of service.

In the Knickerbocker Laundry Company plant at Long Island City, New York, the attention value of the site, which is passed daily by approximately 500,000 commuters on the Long Island railroad about 150 feet away, was considered in the building design.

Technical Requirements

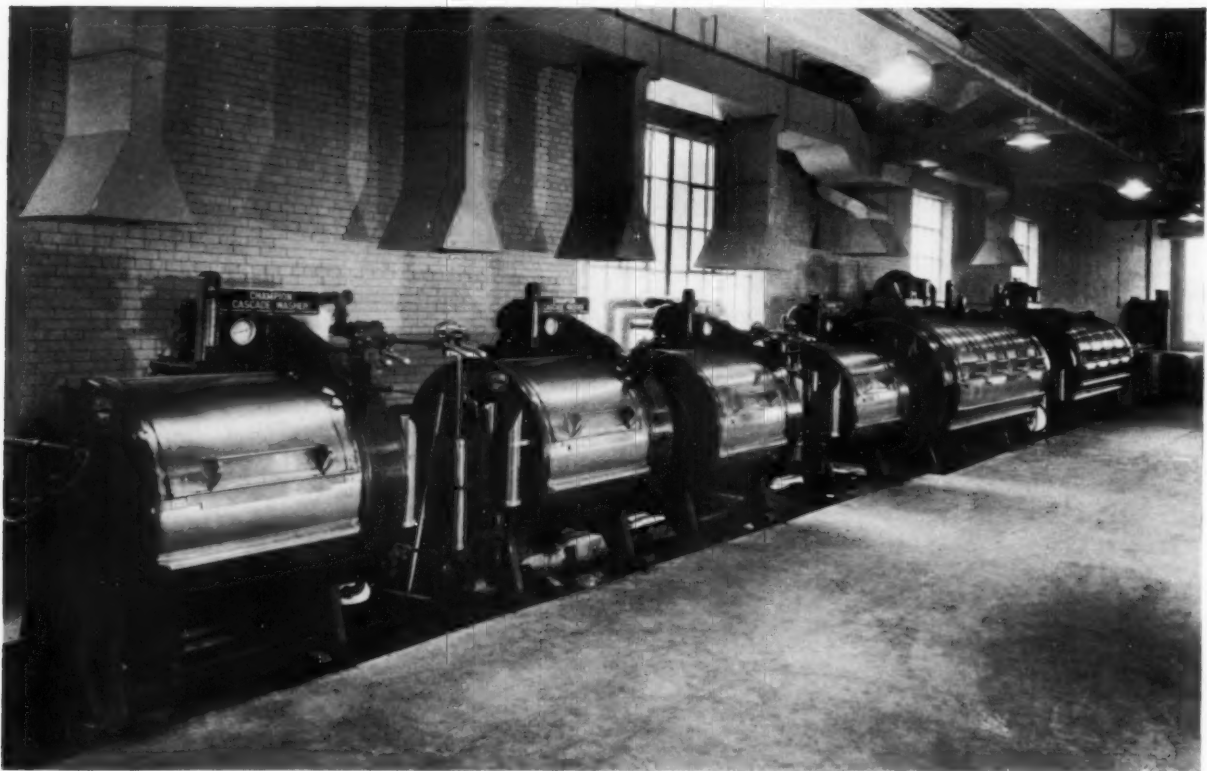
An analysis of the territory to be served and the probable classification of services to be rendered are necessary preliminary considerations in determining the most efficient plant arrangement. Complete coordination of mechanical and architectural design is even more desirable in the design of a modern laundry, dry-cleaning and dyeing, and rug cleaning plant than in design of general industrial plants. So predominant is this requisite that the architect possessing a knowledge of mechanical design is at a great advantage.

Knowledge of the proper design of the water system, of variable temperatures, the steam for process and heating use, the condensation return system, the compressed air requirements, and the like, is of prime importance, together with an understanding of the construction and function of the mechanical equipment.

The idea that an industrial plant is a structure designed around some typical arrangement of mechanical equipment or that it is a typical building in which the required equipment has to be arranged in the best manner permitted by the structure, will not produce the most efficient results in the design of laundries. The most advantageous location of the power plant; its proper construction to suit the equipment to be installed therein; planning of the most advanced conveying systems; the mechanical requirements as outlined; considera-



Laundry pressing department.



Akron

Battery of laundry washing machines.

KNICKERBOCKER LAUNDRY CO. PLANT, LONG ISLAND CITY
IRVING M. FENICHEL, ARCHITECT

tion of light (natural and artificial); proper ceiling heights; adequate means of air conditioning—all these must be considered as coincident with the architectural planning.

Success of the plant is greatly dependent upon expedient service. The various departments must be so planned as to permit a routine of operation which eliminates back and cross tracking.

Experience in the design of such plants and close contact with these industries have shown the futility of trying to formulate any reliable basic reference tables, charts or rules which could be applied to the design of a standard laundry or combination of a laundry and supplementary departments. Each is individual in its own requirements and only extensive specialization enables the architect to comprehend the technicalities which must be incorporated in the planning. Minimum ceiling heights are dependent on the heat generating characteristics of the equipment used and the method of natural and mechanical ventilation. The method of marking in and routing the numerous kinds of articles from the time they are received until they are placed back on the trucks for delivery is contingent on which of several systems of identification will be used, whether the laundry will handle family trade, combination of family and contract trade, or entirely contract; also on the price grade of work to be done and whether the articles are dainty linens, heavy overcoats, various sized rugs, and so on.

Knickerbocker Plant Construction

The plant of the Knickerbocker Laundry Company covers an acre of ground, is two stories in height, has a total of 1,500,000 cubic feet and a total of 92,000 square feet of floor space. Its advantageous central location facilitates service of a large area including Long Island, a large portion of Westchester County and all of the Metropolitan area. It is of concrete and skeleton steel construction with brick walls and precast marble limestone ashlar on the principal façade and returns. The choice of steel construction was influenced by the advantages gained through large spans and consequent reduction in the number and size of columns.

The plant generally is arranged to accommodate a complete laundry service and also such departments as dry-cleaning, hat cleaning and the cleaning of rugs and carpets, curtains and blankets.

Power House

The power house shown in one of the accompanying illustrations is an extension to the northeast corner of the plant and connects with the engine room of the adjoining ice plant, which is under the same ownership. Installed in the power house are two bent tube oil-fired boilers, each having 4,000 square feet of heating surface and capable of developing 1,000 horsepower. They are designed for working pressure of 199 pounds. Also, there are steam generators and other power plant equipment. Cat walks and other approaches to the

boiler and power plant equipment are placed at various convenient levels for the engineer. The automatic electric control board serving the laundry is located in the power house at the same level as the second floor of the main building and offers a convenient approach from the laundry operating floor as well as the boiler room.

Plant Arrangement

The first floor of the main building is divided into garage space, driver's control room and convenience rooms, rug department, cafeteria, office space, etc.

Midway between this floor and the second floor is a mezzanine used as an employees' entrance. It is of ample size to accommodate locker rooms, toilet rooms, washrooms and also a hospital room. This mezzanine is easily accessible to the cafeteria as well as the operating floor.

Approximately 41,000 square feet of undivided floor space on the second floor (the principal operating floor) are used for laundry and dry-cleaning work. This vast open space is easily viewed from the observation mezzanine located at an elevation midway between the second floor and the roof. The balance of the floor is divided into a general office, private managerial offices, toilet compartments and the main entrance foyer.

The foyer is octagonal in shape, has a vaulted ceiling approximately 18 feet in height, and a bronze entrance vestibule. It is finished with white texture plaster, Belgian and black and gold marble, and Allegheny railings. Stairways which lead from this lobby serve to the observation mezzanine above and also to a penthouse on the roof in back of the central tower. This room is used as a reception room for visitors and as an executive office.

The plant has the most modern type of machines for the various departments. An accompanying photograph shows a small portion of the laundry pressing department and indicates the ease and compactness of operation afforded by the equipment arrangement. Another photograph of the operating floor shows a few of the Monel metal laundry washing machines.

A complete air conditioning system introduces, during the summer months, 157,000 cubic feet of thoroughly washed and cooled air, entirely free from dust, and effecting a three and one-half minute air change. During the winter months, 55,000 cubic feet of washed and preheated air are introduced for a ten-minute air change. The air pressure in the laundry is always maintained somewhat higher than outdoors to prevent infiltration of dust-laden air.

The dry-cleaning department has modern equipment including a "Zoric Unit" which dry-cleans with a noninflammable cleaning solvent, referred to in the early part of this article. The conveying system is arranged to take the incoming bundles from the first floor to the operating floor, through the various processes and then back to the distribution bins located in the garage.

<i>Classifications</i>	<i>Architect Planned</i>	<i>Privately Planned</i>	<i>Total</i>	<i>Architects' Percentage of Total</i>
Commercial Buildings	\$19,513,000	\$16,559,800	\$36,072,800	54.1
Factories	5,245,800	7,911,400	13,157,200	39.9
Educational Buildings	13,452,500	2,093,500	15,546,000	86.5
Hospitals & Institutions	4,748,600	2,720,900	7,469,500	63.6
Public Buildings	7,320,300	2,396,300	9,716,600	75.3
Religious & Memorial Bldgs.	4,393,400	1,289,300	5,682,700	77.1
Social & Recreational Bldg.	4,411,000	2,518,000	6,929,000	63.7
Apartments & Hotels	6,895,000	3,861,600	10,756,600	64.1
One- and Two-Family Houses	7,569,200	9,500,800	17,070,000	44.4
Public Works & Utilities	2,413,700	12,027,100	14,440,800	16.7
TOTAL	75,962,500	60,878,700	136,841,200	55.5
Total Number of Projects	6,169	10,596	16,765	—
Average Value of Projects	37,188	17,276	54,464	—

ARCHITECTS' INFLUENCE IN MODERNIZATION INCREASING

By L. SETH SCHNITMAN

During the third quarter of 1932 modernization expenditures on existing structures of all descriptions in the 37 eastern States totaled \$38,751,100 as based upon the contract records of F. W. Dodge Corporation. Of this amount \$22,351,000 or almost 58 per cent was planned by architects. During the first nine months of 1932 modernization expenditures aggregated \$136,841,200, of which \$75,962,500 or 55.5 per cent was architect-planned. It is thus seen that the architect's influence in modernization work has become progressively more important during recent months.

A large part of this modernization work has been in income-producing structures, i.e., commercial buildings, factories, apartments and hotels, for which architects are especially equipped, by training and experience, to render sound and constructive designs to meet effectively obsolescence and keen competition for tenants.

Contracts awarded during the first nine months of 1932 for all classes of buildings, as apart from engineering work, totaled \$623,092,000 in the 37 States east of the Rocky Mountains. Of this total \$122,400,400 or about 20 per cent represented the value of contracts for modernization, alterations and additions to existing buildings. In addition engineering construction contracts awarded during the period for the same area totaled \$434,271,200 and of this amount \$14,440,800 represented the value of awards for modernization and alterations.

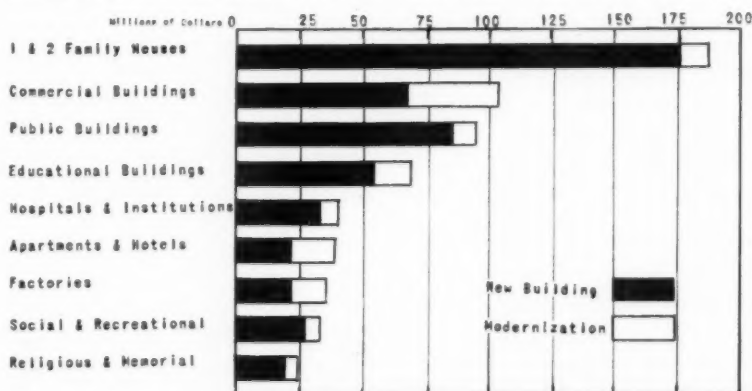
Hence, out of a contract total for all classes of \$1,057,363,200 covering the first nine months of 1932, modernization expenditures amounted to \$136,841,200 or 13 per cent of all construction expenditures.

It appears altogether probable that modernization work over the next few months will gain in importance; especially is this likely because of the growing competition for tenants whose desires have hardly altered though aggregate money incomes have been materially reduced.

Each contemplated alteration project involving major structural changes must necessarily be considered separately. Any major alteration which is designed to correct obsolescence and to improve or restore revenues will fail, however, if pertinent social and economic factors are ignored.

Competition between new and old buildings forces continuous modernization particularly in the case of revenue-producing structures. But this competition should not be permitted to obscure the basic causes that produce it. It is relatively simple to redesign an apartment house and to remove the new objectionable long corridors within apartment units or to cut up large apartment units into smaller ones, but such an operation does not necessarily insure any important increase in earning power of the structure so treated.

BUILDING CONTRACTS FIRST 9 MONTHS 1932 IN 37 STATES



THE ARCHITECT AND SMALL HOUSE COSTS

By HENRY WRIGHT, Architect

Attention is called to the fact that while we still cling to the ideal of the detached single-family house and while, on the other hand, recent progress has been most pronounced in the development of the high-class elevator or garden apartment, nevertheless the largest class of construction in nearly all cities of the East and Central West is in smaller multifamily dwellings known as "flats," "investment bungalows" or similar local names. Anywhere from 40 to 80 per cent of new dwelling construction (the latter percentage is for the second largest city) is in this category. The Committee on Design of the President's Housing Conference found under way in 1931 in one large Eastern city a quantity of construction comprised for the most part of two-family flat dwellings of the most inefficient type.

Recently two interesting studies by architects (see illustration on opposite page) have been developed and published. One by E. H. Klaber of Chicago, a city where moderate price dwellings are for the most part "flats," showed how much better and more efficient well-planned groups of apartment-serviced row houses would be, even in contrast with flats three stories in height. The other study, by Norman N. Rice of Philadelphia, showed how much better efficiently designed two-family flats could be than the inefficient row houses so frequently found in that city.

This contrast suggests a wide diversity of method in our present approach and leads us to ask if it would not be better to attempt a comparison of Mr. Klaber's efficient row house with Mr. Rice's efficient flat before we recommend that these cities swap their types of dwellings with each other. Incidentally, Mr. Rice's efficient flat (see page 441, December, 1931 issue of *THE RECORD*) was almost identical in plan with the efficient flat "B" in the first article of this series (see page 433 of the same issue). It is apparent that the architect's idea of an "efficient" plan is no haphazard or clever accident but the direct product of technical competency developing in a fairly definite and uniform manner. It seems only necessary for the architect to add "economic" reality to "technical" competency.

In an earlier article, which appeared in the December 1931 issue, Mr. Wright set up an analytical procedure as a counterpart of design. This approach, he stated, would place the architect in an authoritative position in the development of communities.

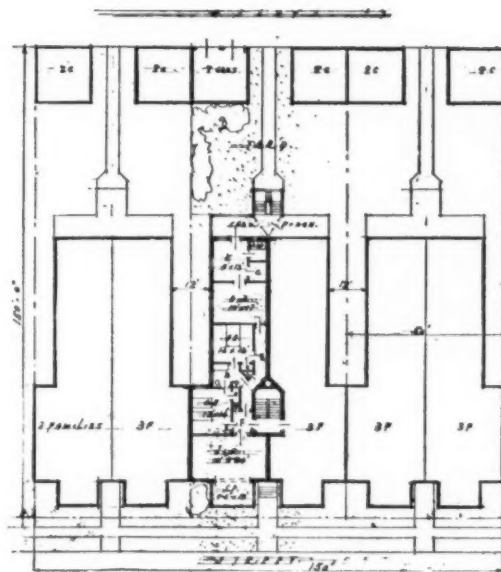
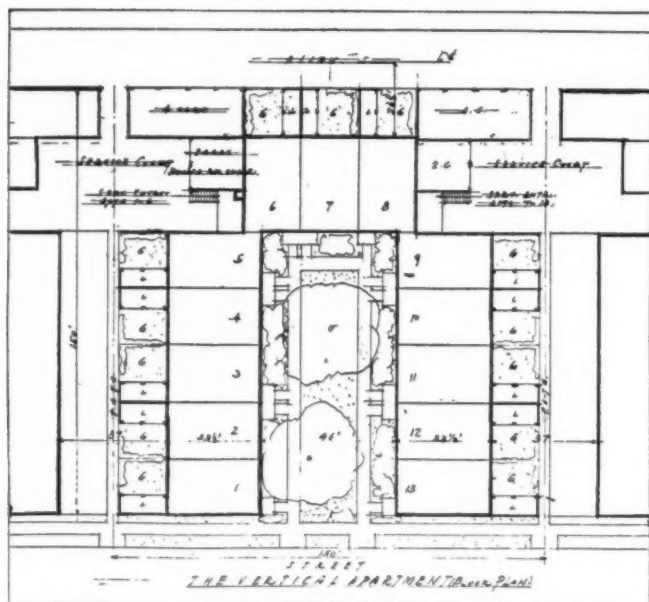
Not until an accumulation of well-tested uniform cost data extending over a reasonable period of time as well as a number of locations is available can we hope to make such technical progress as has been attained in England, Holland and Germany during the post-war period. The nearest approach to this in the United States is probably the experience used as a basis of the data presented in the preceding article. That article was devoted largely to an explanation of the data; in this sequel Mr. Wright develops further the application of the data to the problems of community planning.

Cost and Space Comparisons

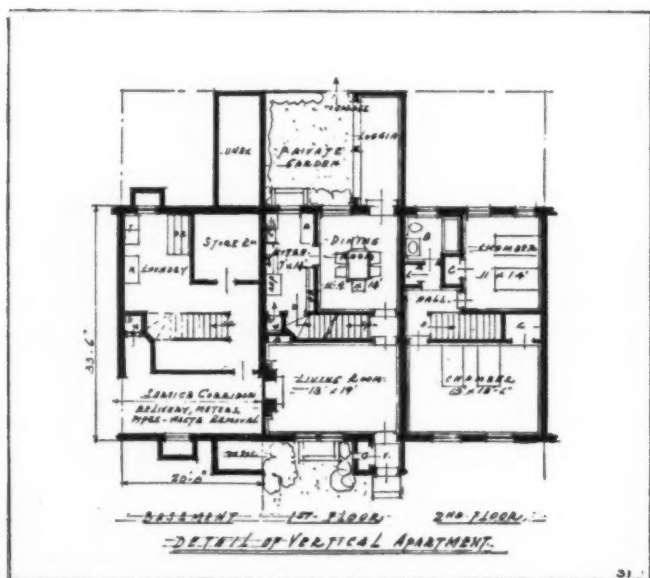
The architect can readily offer superior grouped dwelling forms which contrast favorably with types in current production. He is, however, at a disadvantage in pressing their claims unless he can demonstrate their actual cost advantages both as individual projects and in comparison with the more usual types. In order to expand the analytical principles introduced in the first article on this subject and apply this cost data so as to arrive at fairly accurate comparisons for the various types of dwellings suitable for group housing, the subject is continued here and a second table is introduced to contrast the flat with a row dwelling with more nearly equivalent space accommodations.

An opportunity is provided by our data to compare on a practical basis efficient forms of row houses, flats of various kinds, and even 3- and 4-story apartments of similar plan and construction. In fact, in the same year and as part of the same operation, examples of type "A" (single-family) and "B" (two-family), and 3-story apartments practically identical with "B" were all built of similar construction and the same depth from front to rear wall.

Reference to Table B of the preceding article shows that the serviced-flat "B," in comparison with row house "A," costs 70 per cent as much for building alone, or 66 per cent with land included, per family unit. However, the net usable space was only 63 per cent as much in each 4-room "B" flat as in the 6-room "A" house. (It should be noted that the house had only one additional small bedroom; the main difference was in the omission of the dining room in the flat). It therefore follows that regardless of relative advantages in terms of net usable space the 6-room "A" house was less expensive even with land than the "B" flat. In comparison, the individually-serviced flat "C," with 76½ per cent as much space, cost with land approximately 80 per cent as much per family.

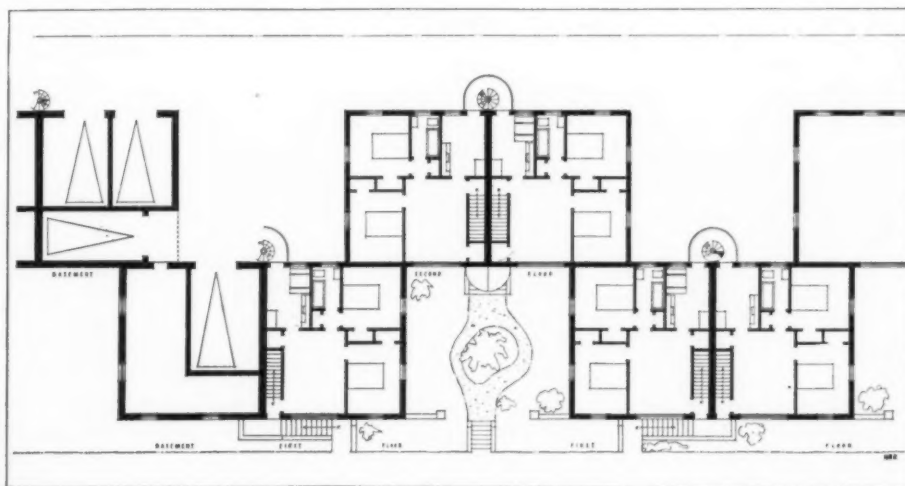


(Above) Plot plan of typical Chicago six-family buildings on 50-foot frontages. Close crowding horizontally of the 18-foot dwelling units gives an unsatisfactory use of the land.



(Left) These two studies—above, a plot plan; below, a detailed apartment plan—by E. H. Klaber, architect, illustrate how the land can be utilized to better advantage by a grouping of rowhouses. Each house unit, as the detail plan shows, is a 3-story apartment. A service corridor in the basement connects all the apartments. Garages are grouped in the rear. Only thirteen instead of eighteen families are provided for, but the combined building and land cost is approximately the same.

(Right) This plan study by Norman N. Rice, architect, shows the advantages of well-grouped two-family flats over the usual narrow lot rowhouses in Philadelphia. In the following pages Mr. Wright suggests that it might be appropriate for Mr. Klaber to exchange designs with Mr. Rice in order to obtain a more ready adaptation of plans to the usual customs of their respective cities.



Row House Economies

Considering that the usual type of deep lot flat is far less efficient in usable area and more costly than either the "B" or "C" examples, we may readily question such flats as really efficient low-cost housing, except where they are used in contrast with the wasteful form of the fully detached single-family house. In contrast with efficient row houses they would suffer much more than the efficiently planned flats used in this study.

This fact has been generally appreciated for some time by those dealing with both forms on the same building projects. But until recently it has been assumed that while the 6-room row house was

less expensive per square foot of usable space than the 4-room flat, the latter form was essential to provide for low-cost space of less than 6 rooms per family. It was only by making this analytical approach that it was discovered that even 4½-room single-family units (two bedrooms, living room, dining room and kitchenette, or dinette and kitchen) could be built as interior elements in group row houses at so nearly the cost of similar space in two-family flats as to obviate further the necessity of using the flat as a principal element in low-cost group housing. The two-family house, however, is not eliminated from consideration; for dwelling units of 4 or 5 rooms the row house and

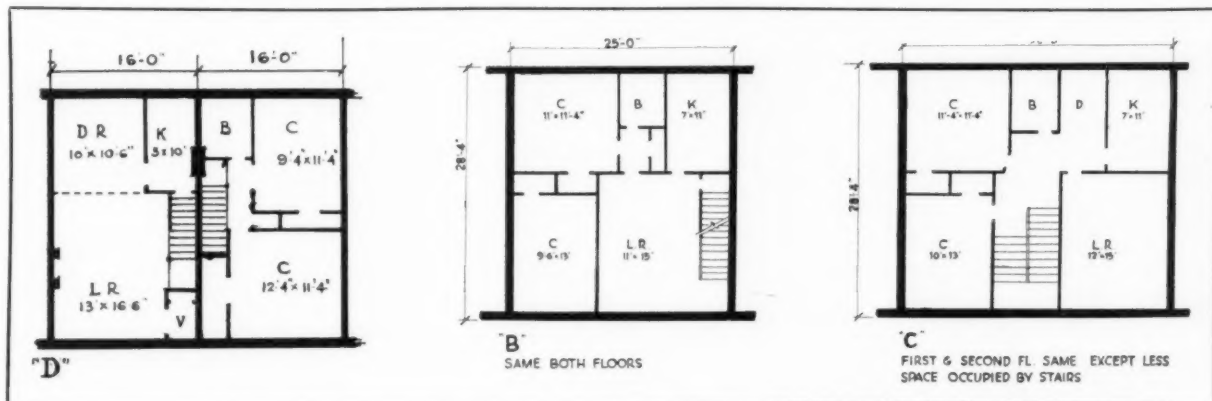


TABLE C*	(D) SINGLE-FAMILY HOUSE	(B) SERVICED 2-FAMILY HOUSE (d)			(C) NON-SERVICED 2-FAMILY HOUSE (e)		
	Built only as interior of row. Costs deduced from 20' house Table B*	Interior Row	End Row or Semi-Detached	Detached House	Interior Row	End Row or Semi-Detached	Detached House
Size.....	16x28.8	25x28.4	25.6x28.4	26x28.4	30x28.4	30.6x28.4	31x28.4
Cu. Ft. @ 20e.....	13,600	21,240	21,665	22,140	25,500	25,925	26,400
Net Cubage Cost.....	\$3,000*	\$4,248	\$4,333	\$4,428	\$5,100	\$5,185	\$5,280
Uniform Items (a).....	\$1,420	\$1,420	\$1,420	\$1,420	\$1,420	\$1,420	\$1,420
End Wall.....	.....	.....	\$450	\$450	.....	\$450	\$450
End Wall, Half Chimney.....	.....	.....	.....	\$515	.....	.....	\$515
Double Equipment (b).....	.....	\$775	\$775	\$775	\$1,200(y)	\$1,200	\$1,200
Total Building Cost.....	.....	\$6,443	\$6,978	\$7,588	\$7,720	\$8,255	\$8,875
(L) %.....	\$4,420	100	108	118	100	107	115
Lot Size.....	16x100	25x100	35x100	40x100	30x100	40x100	45x100
Lot Cost, Improved (c).....	\$672	\$1,060	\$1,450	\$1,655(x)	\$1,270	\$1,630	\$1,835(x)
Total Cost.....	\$5,092	\$7,503	\$8,428	\$9,243	\$8,990	\$9,885	\$10,710
Cost per Family.....	\$5,092	\$3,751	\$4,214	\$4,621	\$4,495	\$4,962	\$5,355
% on Basis (d).....	100	73	83	91	88	97	106
Usable Area, sq. ft.....	735	600	600	600	725	725	725
% on Basis (d).....	100	82	82	82	98.5	98.6	98.5

*For detailed information of the various basic items in this chart, reference should be made to the original chart in the December 1931 issue, page 433. The principal item of difference here is the \$3,000 structural cost of the 16' x 28.8' row house. All the previous examples were approximately uniform in a structural cost of 20c. per cubic foot, but as explained in the text, the 16-foot house with as much detail as the 20-foot house must be figured at only 12c. a cubic foot (\$100 a running foot) less for the 4-foot reduction in width, resulting in a cost of \$3,000 instead of \$2,720, or about 22c. a cubic foot.



A 10-room flat terminates this row of single-family houses at the Sunnyside Gardens development on Long Island. F. L. Ackerman, architect.

the two-family house are virtually interchangeable and should be so used with freedom to meet varying family needs.

Analysis of 16-Foot Row House Unit

In the first article the 6-room interior row dwelling was shown to cost \$4,820 net without land. To reduce this 20-foot house to a width of 16 feet it is permissible to deduct only 12c per cubic foot (or \$100 per foot of decreased width), since the resulting 4½-room unit has nearly as much framing, door and window openings, and other elements as the 20-foot 6-room house. Also, the kitchenette equipment essential to fit into its compact space is relatively expensive.

The cost factors may then be stated roughly as \$4,820 less \$400, or \$4,420 for building; 20% of the land cost is saved, which on \$42 per foot land leaves \$672 for the lot, or a total net cost for the unit of \$5,092. This 16-foot unit has two good

bedrooms and an effective arrangement of living room and dining alcove space even more favorable than the 4½-room flat. It has 735 square feet of good usable space. Compared with the 4-room serviced-flat "B" with 600 square feet of space, it will cost with land 36 per cent more for 22½ per cent more space. Compared with the 4½-room flat "C," which has separate services for each family, when equalized for area, the cost of the house is less than 10 per cent more than for the flat. The additional advantages of an entirely individual dwelling and lot (individual ownership possible if desired), avoiding the difficulties of sound transmission through superimposed living floors, would seem to entirely warrant a 10 per cent greater cost. Aside from this, flats are seldom built in continuous rows, although they were so built in connection with row houses in the Bridgeport War Housing projects and at the Sunnyside Gardens development on Long Island. More usually such flats are built semi-detached or detached for more ready sale to resident owners. If these 16-foot interior row houses are compared with the "C" flat in semi-detached and detached form the comparative costs with \$42 per foot land are for 4½-room row house 100 per cent, for semi-



detached flat (rectified for area) 99 per cent and for detached flat 106 per cent.

The 16-foot row house occupies only one foot more frontage per family than the "C" flat which is 30 feet wide. The semi-detached flat requires 20 feet and the detached about 23 feet per family so the row house has an advantage in the land cost. Any effort to rearrange the semi-detached flat with a narrow front so as to go on a 30-foot lot with even a 6-foot side yard (making the building 24 feet wide) will be found to entail losses in plan efficiency which quickly absorb any land saving up to \$100 per foot, beyond which neither the row house nor the two-family dwelling is practicable.

Central Park Space

In the combined row grouping of single-family and two-family dwellings as carried out at Sunnyside the frontage per room is almost the same. The grouping of both types in this project was accomplished by dividing 900- by 200-foot blocks into three groupings. The almost free-standing dwellings which are projected back to form the group ends are specially planned 2-story 3-family dwellings with one family below and two above. The other groups on the side streets were arranged as

The termination of this row of single-family houses at Sunnyside Gardens is a two-family house with a recessed three-family flat attached at side.

follows: in the middle, 6-room row houses; at each end, one double flat of which the interior unit had 4 rooms and the end 5 rooms per floor, taking advantage of the end exposure for bathroom lighting; the group facing the block end was composed of 2-family and 3-family units.

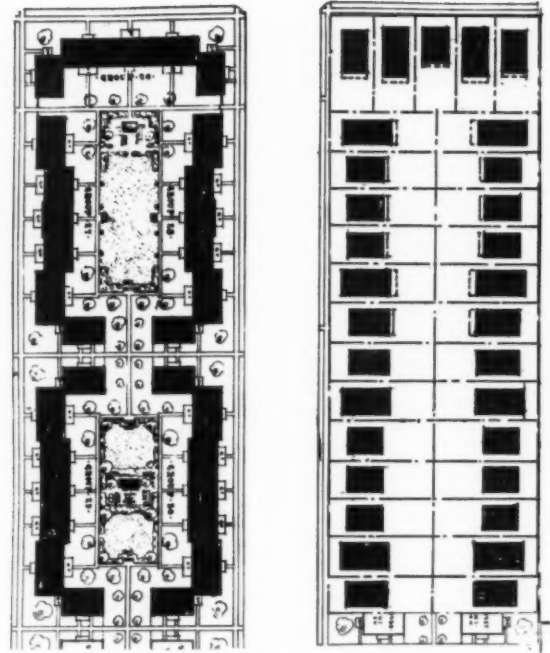
If exactly the same building area (not nearly so efficient in usable area) had been arranged in individual buildings on normal lots, the result would be as shown on the contrasting block, page 394. Most of the area devoted to the central park space would, in the ordinary plan, have been dissipated in the narrow side yards between buildings. The amount of costly exterior walls would have been increased by 40 per cent and many rooms would have had frontage only on the side yards. The actual economies and benefits of such group planning as used at Bridgeport and Sunnyside have never been fully utilized in this country although they have long been the foundation of economic housing abroad.



Brown Bros.

(Above) Interior court of Sunnyside Gardens, Long Island.

(Right) Block plan of Sunnyside development contrasted with ordinary block of individual detached units.



Four types of plans constituting each building group.

SUNNYSIDE GARDENS, LONG ISLAND—CITY HOUSING CORPORATION
HENRY WRIGHT AND CLARENCE S. STEIN, ARCHITECTS

ARCHITECT OR BUILDING ECONOMIST?

Should the services of the architect be adjusted in order to obtain new business?

Should the architect be paid for advice and consultation on the same basis as the physician and lawyer?

By LIONEL M. LEBHAR
Lebhar and Pierpoint, Architects

Whenever a prospective client announces, "I cannot afford an architect," and therewith ceases to be a client, our professional standing has been attacked. We are an essential part of any building program, regardless of its size, and must combat all opinion to the contrary.

The business we lose annually because of the mistaken idea that an architect is necessary only for work of a certain magnitude may be estimated from any reliable chart of building operations. We find a surprising volume of small work, the bulk of which goes directly to the building contractor and which does not benefit from the services of an architect. Since it would be to the advantage of both owner and architect if most of this work received some form of architectural assistance, it is evident that this field is worth cultivating. In these lean times can we continue to neglect it?

Before we blame either owner or contractor for this elimination of the architect, let us see whether we ourselves are not most at fault. If an owner believes that he is not able to afford an architect instead of understanding that he cannot afford to do without one, may it not be that in too many instances we have proved expensive when employed for minor work? And, if so, should we not readjust ourselves in order to secure business which is available even in these days of depression?

The versatility of the architect, which applies to every phase of building, is perhaps our outstanding characteristic. Yet how very little effort we have made to establish this fact in the public mind! Looking back some thirty years, it would seem that we had actually gone out of our way to convey the opposite impression.

Early in this period architects were sticking pretty closely to their particular muttons. We had the architect who turned out apartment houses principally. The commercial architect who gave us our business architecture without leaving many examples for our inspiration. Our "monumental architects" who were content with most of the important undertakings but sometimes condescended to dabble in lesser work if it was sufficiently "de luxe." It remained for the "small architect," who was willing to tackle anything, to function with any degree of completeness.

As we approach our own times, we find architects using their training and experience with more intelligence. They apply it without dis-

crimination to a wide diversity of building types. A service station, some "tax-payer" or a chain of outdoor refreshment stands receives their attention and immediately it becomes a model for further accomplishment. Do they not serve the public and our profession more truly than if they stood aside, as in the past, and left these humble tasks to less capable hands?

While some minor work is done by architects, a great part of it is not. For this we are largely responsible. An august group decides that an individual architect may be dispensed with for residences of six rooms or less and broadcasts the theory. Certainly that does not help promote the idea that an architect is necessary in every building activity.

We do not improve the situation either when we develop a minor operation into a major one, which often follows from our employment. This is what many an owner has in mind, rather than our insignificant fee, when he says, "I cannot afford an architect." Only too frequently we consider a job an opportunity for ourselves instead of a chance to serve a client without permanent injury to his pocketbook.

To understand the owner's point of view on this, we might consider our own relations with our physician. We do not go to his office with a common cold and fear that, to show his skill or from other motives, he will build up a nice case of double pneumonia, because doctors do not work along these lines. But we have no difficulty in recalling many building operations where money was spent far in excess of what the project really demanded. In those instances the architect did far better for himself than for his client.

This brings us directly to the point covered by our heading. Is not our true field that of the building economist, who settles the vital matters of investment and return before going ahead? Unless we are willing to let the belief continue that an architect exists merely to "draw up blueprints" it would be wise for us to travel further in this direction than we have already gone.

In illustration of this idea, let us turn again to another profession. When we consult our lawyer regarding our legal position in some matter we do not expect him to prepare a brief, but to tell us what we may or may not do. Likewise an architect proves his value without drawing a line when he advises a client on any building question.

In either case a service has been rendered for

which the client will pay. The objection may be offered that clients seldom do pay architects for advice. That is true but principally because it has been our custom to furnish it gratis as a preliminary to making sketches. These, perhaps, will overcome the victim who may then be persuaded to sign a contract or at least to pay for the drawings!

Unfair as this procedure is to the client it is also unsound from the architect's standpoint. Few sketches thus prepared are ever paid for since they may be altogether unnecessary. Had the building economist instead of the architect been on the job, the sketch stage might never have been reached. A careful analysis of all the facts involved would have uncovered the obstacle which usually upsets propositions of this kind.

As every architect knows, there is nothing quite so dead as a project indefinitely postponed unless it is the sketches which have been made for it. Consequently, however reasonably we charge for them, we are asking payment for something which has no value. Advice, without sketches, would have cost our client much less and answered all requirements.

The trained and experienced architect is particularly well fitted to advise. Unlike the contractor, manufacturer or material man, he is disinterested and impartial. Owners will naturally prefer to come to him for counsel when they understand that they may enter his office without setting wheels in motion which will grind out a "job" at their expense.

Granted that there is much minor work to be done and that we architects can do it if we will revise our outlook somewhat, the question then arises, can we show a profit on this class of business? Unless it is profitable it is not likely that we will care to continue with it after times improve. And then, during the next period of depression, we shall find ourselves as much out of the picture as at present.

Minor work *can* be handled at a profit. We know that certain contractors maintain a jobbing department for small work which would otherwise clog up their organization. They find this small work not only profitable, under such method of operation, but also that it frequently leads to larger things.

We are reminded of a well-known architect who was overheard telling a prospective client that his \$150,000 project was not large enough to interest his organization. This may sound wildly improbable at this time but it actually happened less than four years ago.

Strangely enough, this large office did maintain what it termed "the bush league" for exactly this purpose but evidently it could operate only when

a "job" bore the required number of ciphers. To complete the story, we might mention that this architect is now in a far distant country attempting to "drum up" some business.

A large part of the minor work referred to is, of course, residential. This also may be brought within our scope if we are willing to revise our methods in dealing with it.

Much has been written and said both for and against the Architect's Small House Service Bureau. Perhaps the most telling indictment would be that it functions as a wholesaler who, by dealing directly with the consumer, puts the retailer, or the small architect, at a great disadvantage. Moreover the experiment, however "noble in motive," has proved unprofitable.

The contention that the small house builder will not or cannot pay the architect's customary fee for complete architectural service is largely justified. Admitting this, we may then be able to suggest an alternative which will allow architects to profit from the small house.

We may admit further that the stock plans of the Bureau are all that is claimed for them. Also, that if a made-to-order plan is financially impossible then a ready-made one is the next best bet. The way is now cleared for a decidedly radical proposal.

Would it not be advisable for the Bureau to discontinue dealing directly with the consumer but, instead, to relinquish this work to architects who desire this business? They, in turn, would select from the stock plans thus made available and, in addition, supply any necessary architectural service, all of which may be done profitably for a relatively small fee. Here is how it might work:

Mr. Brown enters our office and, after raising our hopes by telling us that he wishes to engage our services for his modest dwelling, informs us that he cannot afford to pay our regular fee. We agree cheerfully and then explain what we are able to provide for the price he stipulates he can pay. This, naturally, would be less than our regular service and might be as follows:

First, the selection of a stock plan which our experience indicates most nearly fits the requirements of his case. Then the choice of a contractor and perhaps the drawing up of the contract, after our client has secured estimates from the stock plans and specifications which we furnish. Our supervision we limit to the greatest number of visits the price will allow. The agreement with our client states clearly the extent of our responsibility in order to avoid argument later. Certainly the result obtained under some such arrangement as this would be far better than if we had not been called in at all.

TECHNICAL NEWS AND RESEARCH



REX COLE DISPLAY BUILDING IN BROOKLYN, NEW YORK — HOOD AND FOUILHOX, ARCHITECTS

SALES AND OFFICE BUILDINGS

PLANNING SALES AND OFFICE BUILDINGS FOR PUBLIC SERVICE COMPANIES

By JOHN B. RODGERS of BLEY & LYMAN, Architects

Sales buildings for public service companies are intended to promote the use of electricity, coke and gas by the display and sale of utility merchandise. A salesroom completely and attractively displaying such merchandise will interest customers and the general public in the lighting of buildings, induce them to modernize kitchens and laundries and to use all types of gas and electric equipment.

Determinants

The sales buildings of public utility companies are not primarily retail outlets for utility merchandise, nor is their success necessarily dependent on the income produced by the sale of display goods. Designing such a sales building is a problem in designing a structure fulfilling the following demands:

1. Maximum favorable impressions on the public.
2. Easy recognition as being related to other buildings erected by the company.
3. Maximum inviting display of merchandise.
4. Maximum facilities for the demonstration of utility equipment.
5. Maximum facilities for contact between officials and customers.
6. Adequate counters for bill paying.
7. Maximum physical comfort.
8. Maximum flexibility in sales space arrangement.
9. Minimum cost of construction, maintenance and operation.

The problem suggests the use of modern building materials in keeping with the new appliances exhibited. It also suggests the most advanced methods of construction as an indication of the advanced engineering methods employed by the power company in its own field. And finally the problem demands the incorporation of a new architectural element as an integral part of the design: artificial light.

Types

Sales and office buildings for power companies can be divided into two main types:

1. New buildings usually located in villages and cities of the third class.
2. Leased buildings usually located in cities of the first and second class.

There are other types which do not fall into the above classifications:

1. Company-owned buildings in cities of the first and second class containing salesrooms and usually division headquarters' offices.

2. Leased buildings in cities of the first and second class containing headquarters' offices only.
3. Company-owned buildings in cities of the first and second class where salesrooms only, without offices, are operated.
4. Leased buildings in cities of the third class or villages containing salesrooms and district headquarters' offices.
5. Substations in large cities which have a show window front on the street but no salesrooms or offices.

No attempt is made to treat these latter differentiations in this article, but obviously much of the information presented is also pertinent to these types.

Selecting the Location

A survey should first be made of local conditions, determining the population of the city or village as well as of the surrounding territory which trades there; the number of meters, electric or gas or both, and other local conditions which will affect the special requirements in connection with the establishment of this sales building or store.

Criteria of a good location are identical for both types of buildings in various sized communities. The location must be one which can be reached conveniently by most customers. A site somewhat away from the shopping center is allowable.

The best retail street should be chosen. Almost invariably this street will have a good and a poor side and it is advisable to avoid the poor side. A location near a courthouse, post office or other public building is sometimes very good, especially where traffic to and from such places must pass the location; but certain public buildings, such as churches, are less satisfactory neighbors because of the lack of steady traffic near them.

In choosing a new neighborhood, secondhand stores, barber shops, shoe shining parlors and soft drink places should be avoided. Chain stores, banks, drug stores and dry goods stores make good neighbors. Locations near schools are seldom desirable. Corner locations or busy intersections are usually in the greatest demand and consequently call for the highest rentals, but corner locations are best as they present greater opportunities for the display of merchandise in show windows and the display of lighting on the building exterior.

TYPE I—NEW STORES

Layout

Needed information includes: the population of the territory to be served; number of gas and electric meters in the community and in the adjacent countryside; size of lot; whether a branch office or a district headquarters; whether parking facilities must be provided; and so forth.

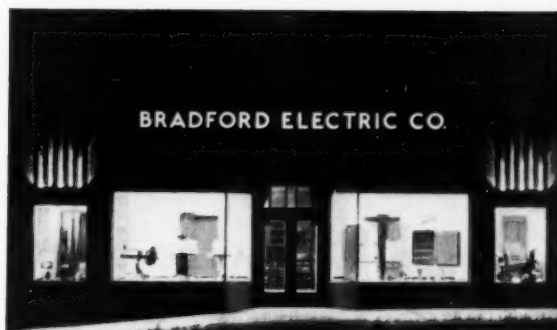
For the purpose of this article the varying requirements for new store and office buildings have been broken down into a set of five typical requirements and tables prepared of property requirements, space requirements, floor areas by floors, floor areas by rooms and cubic contents. These space requirements have been found valuable in actual use.

The plans of several typical buildings designed to conform to these requirements and containing the space allotments specified in the tables are shown on pages 400, 401. Plans A, B, C, D and E are of buildings two stories and basement in height but in the case of types D and E, alternate plans have been prepared to show an arrangement of the first floor of buildings only one story and basement in height. The space requirements for these smaller one-story buildings will also be found in the tables.

In general in these plans the basement contains all necessary service facilities and storage space. If additional storage space is required a vault can be excavated under the sidewalk.

The larger buildings A, B and C have been arranged for an inside elevator and the two smaller buildings for an outside lift.

On the first floor the cashier's counter and customer's service space have been so located as to require the customer to pass as much of the merchandise as possible in going to and from these points. The demonstration kitchen has been placed in full view of customers in the store. In demonstrations an audience will not be seriously disturbed by customers paying bills, consulting the customer's service department, or making purchases. In the case of the corner location the demonstration



A one-story sales and office in Eldred, Pa., designed to serve a small community. Night lighting serves to attract attention to displays. Bley and Lyman, architects. A. W. E. Schoenberg, supervising architect.

kitchen and the audience are visible from the street, thereby arousing the interest of the passer-by, and yet the audience is not placed so as to feel conspicuous and uncomfortable.

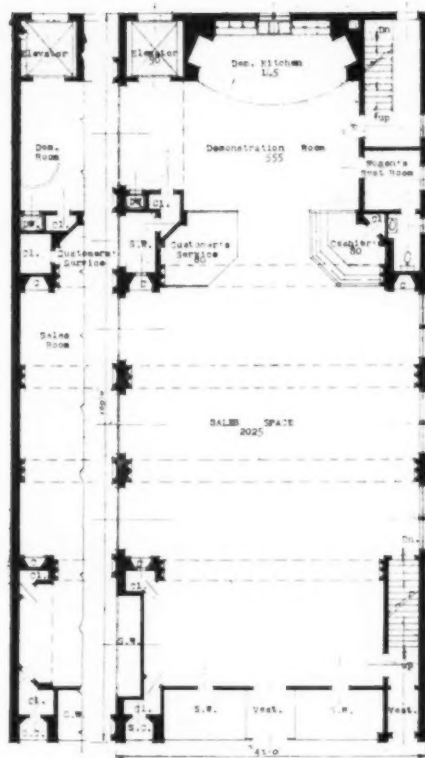
Types A, B and C all have both front and rear entrances with their separate stairways.

In types D and E there is a main stairs to second floor and a rear entrance to the basement and a stairway from the store to the basement, but no rear stairway to the second floor.

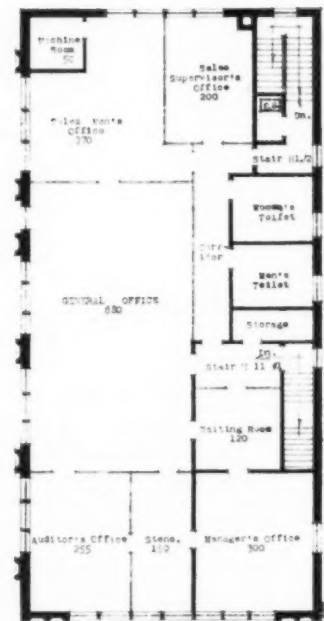
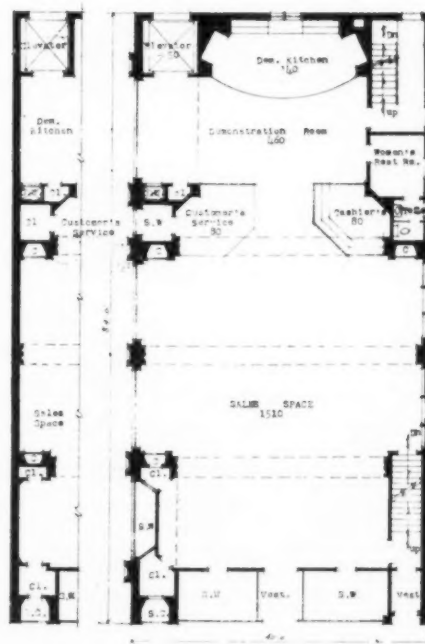
The second floor of all types can be subdivided to suit the particular requirements in any case. In general the toilet rooms, rest rooms and stairs have been grouped together to permit subdivision of the remaining space.

TABLE OF FLOOR AREA REQUIREMENTS FOR NEW BUILDINGS

TYPE	Buildings Two Stories and Basement in Height					Buildings One Story and Basement in Height	
	A	B	C	D	E	D	E
Population.....	20,000 to 30,000	15,000 to 20,000	10,000 to 15,000	5,000 to 10,000	Below 5,000	5,000 to 10,000	Below 5,000
Building Frontage.....	45 to 40	42 to 38	40 to 36	38 to 34	36 to 32	38 to 34	36 to 32
Building Depth.....	105 to 95	88 to 80	71 to 65	55 to 50	38 to 34	55 to 50	38 to 34
Basement Floor Area.....	4,200	3,360	2,584	1,872	1,224	1,872	1,224
First-Floor Area.....	4,200	3,360	2,584	1,872	1,224	1,872	1,224
Second-Floor Area.....	4,200	3,360	2,584	1,872	1,224		
Third-Floor Area.....	A third floor is unnecessary unless requirements are out of the ordinary.						

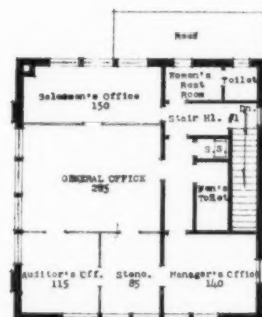
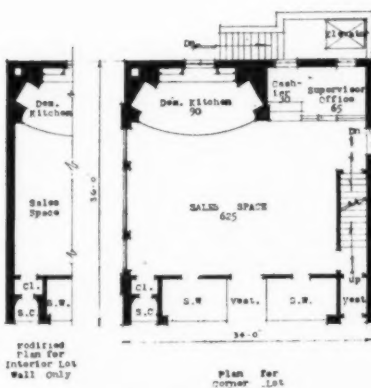
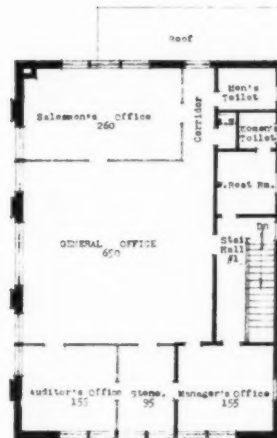
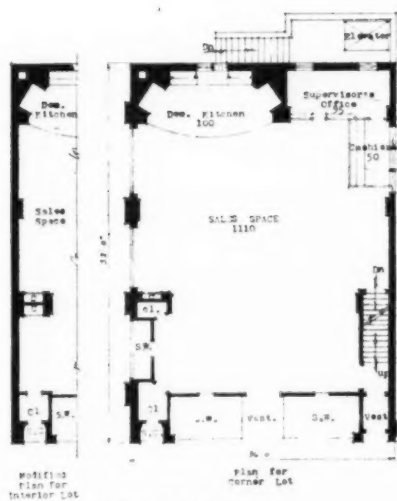
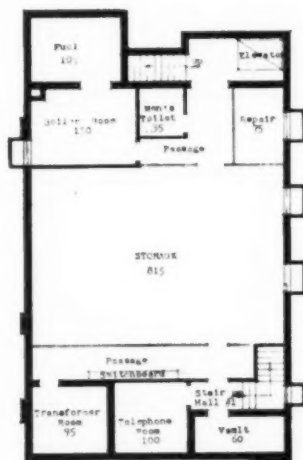
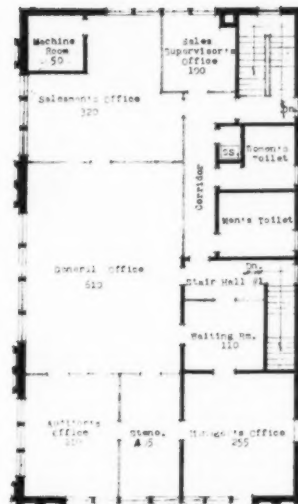
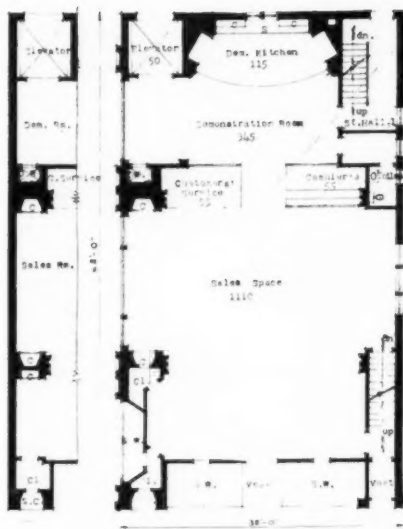
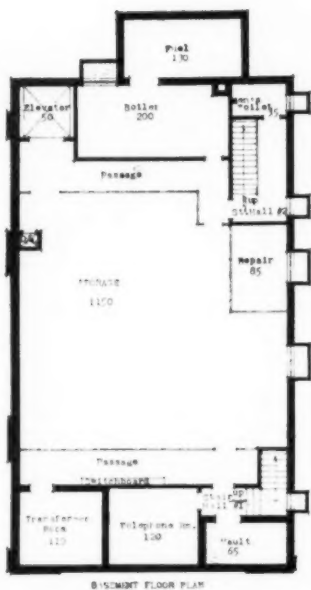


PLAN TYPE "A"



PLAN TYPE "B"

FLOOR PLANS OF DISPLAY BUILDINGS
BLEY AND LYMAN, ARCHITECTS



PLAN TYPE "E"

FLOOR PLANS OF DISPLAY BUILDINGS
BLEY AND LYMAN, ARCHITECTS

SPACE REQUIREMENTS: NEW BUILDINGS

BASEMENT	A	B	C	D	E
1. Boiler Room.....	310	260	200	150	115
2. Fuel Room.....	180	155	130	105	80
3. Transformer Room	150	120	110	95	65
4. Stair Halls and Passage.....	585	545	480	305*	245*
5. Telephone Apparatus Room.	145	125	120	100	60
6. Storage Room...	2195	1550	1150	815	415
7. Repair Room....	105	95	85	75	50
8. Toilet Room (Men's).....	35	35	35	35	35
9. Switchboard Room.....	145	125	Inc. in No. 4	Inc. in No. 4	Inc. in No. 4
10. Elevator.....	50	50	50	None*	None*
11. Vault.....	100	90	65	60	50
Total Walls and Partitions.....	420	380	320	270	213
Total Basement Space	4420	3530	2745	2010	1328

*One stairs and outside basement entrance not included in floor area.
†Outside lift.

Entrance Vestibule and Lobby

Proper entrances should be designed to accommodate the operating company's name and emblem on the floor, doors, door mat, or grille work so that the display windows may be free of all signs and lettering in the line of vision.

Simple shades should be provided on the front doors so that the public can be informed that the store is closed. They should be drawn only at closing time and should be raised after the working force has left in order to permit observation of the interior of the store. Practical mats or other protection in the vestibule or lobby improve the appearance of the floor immeasurably in inclement weather. A night depository which permits customers to pay their bills after business hours is desirable.

Cashier's Counter

The counter should be suitable for serving the customer conveniently, and protected against hold-ups. A satisfactory counter to fulfill these needs is the "friendly" counter now being used in banks. This type of counter has no cage—or other grille work interposed between the cashier and the customer. It consists of a counter with

FIRST FLOOR	A	B	C	D	E
1. Show-Window Space—Front...	180	170	145	130	120
2. Show-Window Space—Side....	80*	50*	30*	25*	None*
3. Customer's Service Space...	80	80	55	95	65
4. Demonstration Kitchen.....	145	140	115	100	90
5. Storage Closets	40	30	25	25	10
6. Main Stairs and Hall.....	70	60	55	50	50
7. Service Stairs and Hall.....	125	115	115	None Not inc.	None Not inc.
8. Service Elevator.	50	50	50	None†	None†
9. Service Entrance.	Inc. in 7	Inc. in 7	Inc. in 7	None†	None†
10. Vestibules: Main Entrance. Office Entrance	75	65	55	55	55
11. Sales Space...	2025	1510	1110	1110	625
12. Cashier's Space: No. of stations. Area.....	3 80	3 80	2 55	2 50	1 30
13. Demonstration Room.....	555	460	345	Inc. in Sales Space	Inc. in Sales Space
14. Women's Public Rest Room.....	90	85	50	None	None
Total Walls and Partitions.....	605	465	380	230	180
Total First-Floor Space	4200	3360	2584	1872	1224

*Applies only in case of a corner location.
†Outside Basement Entrance.

SECOND FLOOR	A	B	C	D	E
1. Main Stairs and Hall.....	140	135	105	135	105
2. Service Stairs and Hall.....	130	130	110	None	None
3. Men's Toilet....	105	90	90	50	40
4. Women's Toilet..	100	90	55	25	20
5. Waiting Room and Telephone Operator.....	120	120	110	None	None
6. Women's Rest Room.....	None	None	None	70	40
7. Manager's Office	305	300	255	155	140
8. Auditor's Office.	285	255	210	155	115
9. District Representatives' or Salesmen's Office....	450	370	320	260	150
10. Sales Supervisor's Office.....	205	200	100	None	None
11. Elevator Machine Room.....	50	50	50	None	None
12. Number of Private Offices.....	1-210	None	None	None	None
13. Stenographic Office.....	150	150	135	95	85
14. Corridor.....	220	145	100	50	50
15. Storage and Slop Sink Closets....	20	60	15	15	10
16. General Office Space.....	1220	880	610	650	285
Total Walls and Partitions.....	490	385	320	210	185
Total Second-Floor Space.....	4200	3360	2584	1872	1224

usually a plate glass partition a foot or less in height between metal or wood posts. It is desirable to install a narrow shelf below the main counter top on the customer's side to place pocket-books and packages when paying bills.

Show Window Design and Arrangement

In general show windows in both old and leased buildings should have a depth of at least 7 feet to permit a satisfactory display of ranges and refrigerators. It has been found that any depth much less than this is too shallow.

Three types of show windows are possible:

1. Entirely open to the store.
2. Entirely closed with a door for access from the store.
3. With a curtain wall dropping down from the ceiling at the back line of the show window to the height of the transom bar of the show window. Hangings at the back of the show windows are arranged to close this space from the store or to pull back and give a view of the store.

The first method has the disadvantage of giving no background for the articles on display, although it allows store interior to be seen.

The second method has the disadvantage of not permitting the public to see into the store, but has the advantage of giving a satisfactory background for the merchandise displayed.

The third type has been found most satisfactory where there are only one or two show windows fronting on the street. In case of a corner location and a new building where it is possible to have show windows with closed backs, as well as show windows without backs, the arrangement illustrated in the plans of all five types has been found most satisfactory.

Show windows should be so arranged as to provide easy access to them for large appliances. Doors to show windows should be ample in size.

Show-window floors may be covered with any one of several materials: terrazzo, Zenitherm, maple or oak block, linoleum, rubber tile, plain oak.

Windows may have hangings at either side with a valance across the top to conceal the reflectors in case the window has no transom. The high intensity of show-window lighting demands adequate valances, or other protection for the eyes of both passers-by and visitors in the store. One great disadvantage of open-back windows is that it is necessary to provide an inner valance to conceal the show-window reflectors from view when looking toward these windows from the sales space.

When windows are permanently or temporarily open to the store it is advisable to use portable screen backgrounds in connection with the display of appliances. These screens placed either singly or in groups should be both higher and wider than the display and should be varied in both width and height with the changes in window arrangement.

No lettering should be placed on show windows.

Demonstration Kitchens

The design and arrangement of several demonstration kitchens are illustrated in the accompanying plans and photographs.

These demonstration kitchens have been considered as stages and have been planned to interest the customer in the use of electric and gas appliances in the home. They have as their main purpose the teaching of many methods of using electricity and gas in the home. They are placed at floor level except where by reason of the number accommodated in the audience it is necessary to raise them one step to give a clear view.

The demonstration kitchen should be placed to permit an unobstructed view from the street through the show windows as well as from the entrance and front of the store. It should have ample space in front to accommodate an audience of 25 to 75 persons, depending on the size of the community served.

A dishwashing sink should be provided except in the smallest demonstration kitchens where an ordinary sink or a portable dishwashing machine may be used. A refrigerator, range and a kitchen-aid model should also be provided. A gas and electric range outlet as well as water and waste connections should be provided in the center of the floor at the front of the demonstration kitchen. Provision should also be made in a conspicuous corner for a gas or electric storage water heater in actual use. This provision is particularly important in towns which are the center of large rural populations.

If the demonstration kitchen and assembly space are arranged for a large audience a preparation kitchen should be adjacent.

In each kitchen cupboard space should be provided for china, silverware, pots and pans, linen. A ventilated towel rack should be incorporated in the cupboard.

Metal folding chairs with leather seats and backs are satisfactory for audience use and can be purchased with racks for storage.

Store Furniture

All store furniture should be portable for these reasons:

1. In stores with a limited floor area a place must be cleared periodically for seating the audience in front of the demonstration kitchen.
2. If the store is enlarged or altered it will be necessary to rearrange the layout of the store furniture.
3. In the case of a new store, a more efficient arrangement of store furniture than the original one may be found after the building has been in use.

In general the furniture required will be: island counters, show cases, display tables, desks, chairs, paper baskets, stands on which to display merchandise, portable screens, vacuum cleaner tables,



A demonstration kitchen in a public utility sales building in Niagara Falls, New York. This building corresponds to Plan Type "A." Wall dials indicate cost of operating appliances in this kitchen. Bley and Lyman, architects; Kirkpatrick and Cannon, supervising architects.

lamp display racks, clothes racks on which to hang clothes used in demonstrating washing and ironing machines, wrapping stands, and so forth.

Store Arrangement and Display

Suggestions for presentation of merchandise are listed in the following quotations from a Department of Commerce publication entitled "Small Store Arrangement":

1. A clean attractive exterior with well-dressed inviting display windows.
2. A well-lighted, well-ventilated orderly store with sufficient aisle space.
3. Open display of as much merchandise as possible; all goods given display space in relation to the profit returned and seasonal fluctuations.
4. Goods plainly price-marked.
5. Display of goods to permit handling by customer (some perishable goods excepted).
6. Encouragement of self-service to such an extent as the merchandise permits, conforming to store policy.
7. Arrangement of merchandise to bring about maximum sales per customer and elimination of unnecessary steps by clerks.
8. Removal of barriers to maximum circulation by customers.
9. Concentration of stock in the smallest floor space possible, as dictated by all conditions at hand.

The principal objective is to secure maximum possible exposure of merchandise to possible purchasers and still obtain convenience in the payment of bills or transacting other necessary business.

"Bill paying" and "customer service" facilities are obviously best located toward the rear of the

store area; in relation to the entrance they should be as far removed as possible.

Most people inherently bear to the right and the most important items should appear successively along the right of the aisle. While the natural tendency is to bear to the right, this can be controlled somewhat by remembering that if given a choice people will generally choose the wider of two aisles.

Lower priced and "pick-up" merchandise is well located close to the cashier area so that bargains or less than a dollar items may be purchased with loose change received from cashier. These must be especially labeled with prices and sales points to emphasize purchase advantage.

The front center of the store should be equipped with fixtures or space to display successively the "feature item" (usually a medium sized or major appliance) on sale. If entrance to store is at one side of store front, this "feature spot" will be directly in front of patron upon entering. Taller items should be placed against walls while shorter items fill in between. A few chairs should afford a resting place for patrons waiting or considering merchandise, especially major items that require deliberation.

The cashier area should have one or two special interest, or seasonal, items close at hand. This location is also suitable for an electric drinking fountain.

The trend in modern store arrangement is open display, which enables customers to see and handle items. A store sells its merchandise, not its store furniture, so it is the merchandise and not the wood, glass or metal of the furniture which must have the prominence.

Floor cases and tables should be portable whenever store area is limited. Portable screens should

be available to separate home-making classes from the rest of the store. People in classes dislike being under observation by others in the store or by the passing public.

Exterior Lighting

Lighting as an integral part of the design of a sales and office building for a power company is the primary medium by which the company can demonstrate the advantages of light to the merchandisers of the community. Through the medium of its own building the company can inform the community of the possibilities of modern night lighting. The intensity of the lighting of the front of the building should be higher than that of other buildings in the neighborhood.

The main exterior sign should be designed to be legible by day as well as at night. An inexpensive type is composed of an exterior face of plate glass with a painted background, back of which opal glass forms the letters. The opal glass is lighted by bare lamps and the whole is inclosed in a recessed metal box with access doors in the rear. It is impractical to use fused structural glass of two colors, one color for the letters and one for the background, as the difference in temperature between the lamps in the box behind the sign and the outside air quickly cracks the sign. Molded glass letters can be used. Bright metal letters against a dark background are legible by day and are legible by night when outlined with Neon tubes.

Floodlighting can be used but buildings of the size discussed in this article are more successfully lighted by fixtures which are an integral part of the design.

Show-Window Lighting

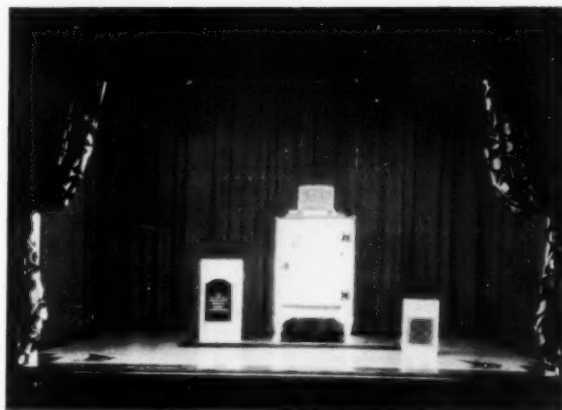
General principles were presented in the Technical News and Research division of THE ARCHITECTURAL RECORD for June, 1931, in a study by K. Lönnberg-Holm, "Planning the Retail Store." These principles also apply to show-window lighting for power company sales buildings. Each location presents its own problem, depending on ceiling height, open or closed back windows, deep or shallow windows, appearance from the store and desirability of special use of spot lights and floodlights. In general it will be found most practical, in buildings of the type discussed, to use 500-watt reflectors on 15" centers for main thoroughfares and 200-watt reflectors on 12" centers on the side windows of a corner store. Another consideration is the use of mobile color and its control. If colored lighting is desired it is necessary to install auxiliary equipment for this purpose. Mobile color is obtained by installing a dimmer bank or the Thyatron control system.

Interior Lighting

Besides using suspended ceiling fixtures it is desirable to introduce various methods of concealed



Hare



Detail views of show windows in display buildings designed by Bley and Lyman, architects. These windows are considered and designed as stage settings for the merchandise display.

and indirect lighting in the interiors of sales buildings for power companies to illustrate to the public the possible effects which can be produced by modern lighting. Therefore the use of opal glass and metal outlined inclosures is logical for display alcoves and wall fixtures, as is the use of cove lighting in the cornice, or suspended trough reflectors throwing light into V-shaped ceiling recesses, or stainless steel troughs concealing lamps reflecting light on structural glass, lightly sandblasted to eliminate specular refraction.

The larger demonstration kitchens are very effectively lighted by a unit which is a trough with prismatic plates having an average intensity of thirty-five foot candles. The smaller demonstration kitchens can be lighted with two 200-watt Westinghouse chromilux units. There should be a fixture over the sink to remind those who attend cooking classes that the addition of light at this point is desirable.

Show-case counters should be lighted with indirect trough reflectors, wall cases with concen-

trating show-window reflectors. Directional signs should be used. They may be of black and white opal glass, edge lighted glass, Neon tubing or metal letters on a glass background.

Heating and Ventilating

The heating system should be of the vapor steam type, with a magazine feed coal boiler burning buckwheat coal in locations where the company does not supply gas and a gas boiler in locations where it does. Gas boiler installation should include the latest type of apparatus with complete thermostatic control and the whole boiler-room installation should be made so that it may be used as a demonstration of gas heating.

All mains should be run on basement ceiling, with magnesia covering, banded and painted. A return trap should be used. Radiators in sales space and in important offices should be of brass or copper concealed in metal inclosures. Ornamental grilles are used for radiators under show windows. In the basement ceiling and in less important locations on upper floors may be standard cast iron. All radiation should have packless valves and thermostatic traps.

The system should be controlled by a clock thermostat located in the sales space.

Ventilation of the sales space and demonstration kitchen should be by means of a suction fan taking air from the sales space and from the kitchen ceiling and exhausting through the roof. This air enters through doors, windows and a transom grille at entrance. Particular attention should be paid to the ventilation of all inclosed show windows, which should have louvered doors, grilles in ceiling and ducts to roof ventilators.

Interior toilet rooms should have mechanical ventilation separate from the main system.

A kitchen-type wall box fan should be installed in rear wall of demonstration kitchen for demonstration purposes.



A sectional removable cashier's counter in a leased and altered branch store in Buffalo, New York. Bley and Lyman, architects.

Electric Wiring

The company should install the necessary lighting and power transformers with all primary equipment in vault provided. Adjacent to the vault should be a power and lighting distribution board of the dead front type feeding the various circuit panels, the range outlets and motor outlets and carrying the main line switches. Ample spare capacity should be provided. Where the size of the building justifies it, the board should be of the air circuit breaker type.

All wiring should be in rigid conduit; circuit panel feeders of full capacity for the panel; panels preferably of the fuseless type. No branch circuit wire less than No. 12 should be used.

Circuits controlling show window, exterior and sign lighting should be on separate feeder with time switch. There should be two floor outlets in each show window, duplex convenience outlet around side walls of sales space on not less than six-foot centers connected two or three per circuit. Floor outlets should be provided in sales space at probably show-case locations; a full circuit for each island counter. In demonstration kitchen two floor outlets should be placed near the front, and convenience outlets provided for refrigerators, kitchen-aid, dishwashing sink and above counter for appliances. Two range outlets of the flush box plug-in type should be placed at front center of kitchen floor (one for smaller stores) and at least two others on walls of sales space.

Motor outlets should be of the safety switch type without fuses where circuit breakers are used on switchboard.

If mobile show-window lighting is used in type "A" stores provision must be made in the panel controlling show-window lighting for connection of Thyatron tube controlling apparatus.

Radio outlets of the combination power, ground and aerial type should be placed in sales space with one on second floor and with an aerial on the roof.

Plumbing

The main sewer should be run under basement floor wherever its elevation in the street allows; if boiler room is below sewer an electric sump pump should be installed. If sewer is overloaded and subject to backup a back water trap should be installed.

Exposed water pipe may be wrought iron or extra heavy steel; concealed water pipe should be brass. All water lines in basement should be covered and all hot-water lines throughout the building should be covered.

Either an electric or gas hot-water tank heater may be used. It should be placed in the demonstration kitchen. Fixtures should include siphon jet closets with flush valves, china lavatories, iron slop sinks and dishwashing sink in kitchen, all with chrome-plated fittings. In type "E" buildings an ordinary sink is used.

Gas connections for ranges and appliances should



Here

SALES AND OFFICE BUILDING IN OLEAN, NEW YORK
BLEY AND LYMAN, ARCHITECTS — A. W. E. SCHOENBERG, SUPERVISING ARCHITECT

be provided in at least one show window, in sales space and gas, water and waste connections under a trap door in front floor of kitchen. A vent pipe should be placed in ceiling of kitchen for demonstrating ranges where the company supplies gas.

Air Conditioning and Cooling Installations

A system of heating by filtered and humidified air with fan circulation may be employed in any of the types of new buildings in place of a steam vapor system, at a slight additional cost. This may be either coal or gas-burning. The air supplied will be cleaner and less dry than the steam installation. The building however will have to be designed for this system from the outset so as to provide space for air ducts.

Mechanical cooling by means of fan circulation

of refrigerated air while perfectly feasible is relatively high in cost. A combination of conditioned air heating and cooling could be installed in any of the plans illustrated at a cost of about three times that of steam heating alone, so that, unless local conditions require something be done to relieve a high inside temperature, the additional cost of such a system may not be justified.

Elevators and Hoists

In the larger buildings the elevator should be an electric 2000-lb. capacity overhead machine, equipped with two part vertical sliding counter-balanced doors on the outside, and single swing doors on the inside.

In the smaller buildings a 1500-lb. sidewalk type, hand-operated platform should be used.

TYPE II—LEASED STORES

If a store is to be leased care must be used to obtain quarters adequate for the purpose. The following are the principal factors to be considered:

1. Is the frontage sufficient to give adequate show window display?

2. After taking off the space required for show windows, cashier's counter, demonstration kitchen, is the area still sufficient for the display of merchandise?

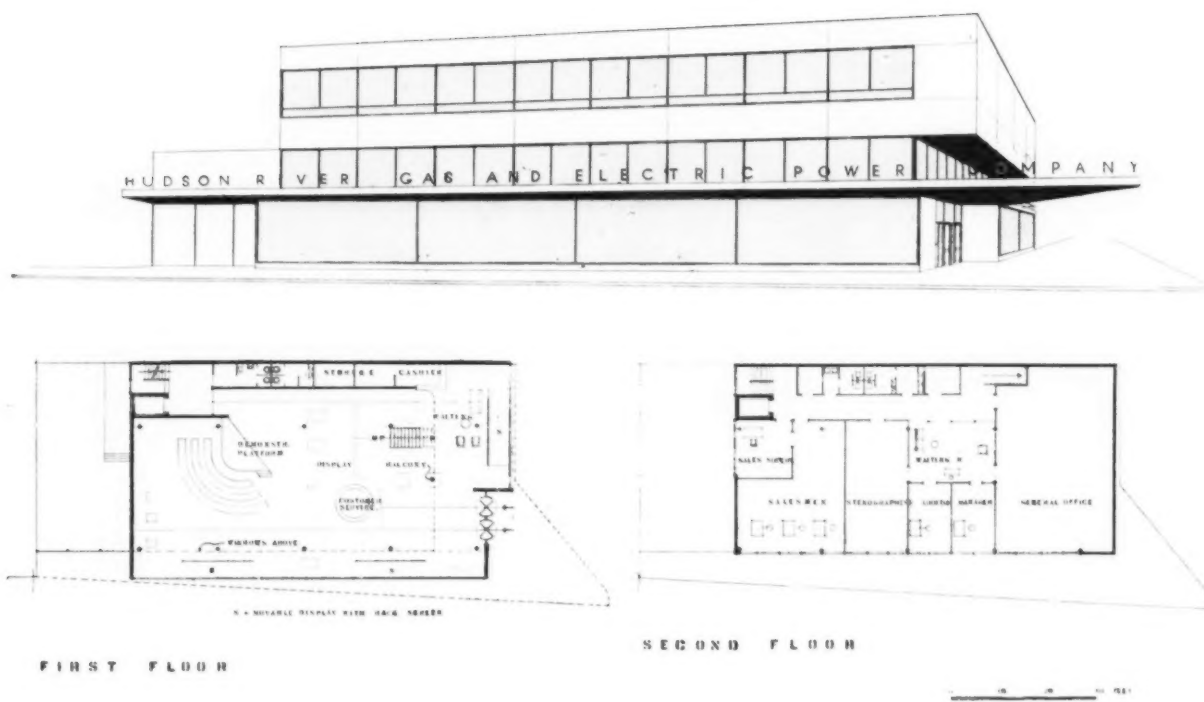
3. Is there sufficient floor space on the first floor to permit the placing of the district repre-

sentatives' room at the rear rather than in the basement? This is preferred because of ventilation and light. Basement quarters should be mainly above grade when clerical workers are housed there.

4. Is there adequate accessible space for the storage of merchandise, either on the first floor if possible, or in the basement?

5. Is the access for loading and unloading of merchandise satisfactory?

6. Is the building substantially constructed and how nearly fireproof is it?



PERSPECTIVE AND PLANS OF A SALES DISPLAY BUILDING
DESIGNED BY ALFRED CLAUSS

7. Are the heating facilities adequate for the store, partitioned off according to requirements and for that part of the basement to be used by employees?

8. Is the front of the building reasonably modern?

9. Is the entrance on sidewalk level?

10. Is the basement dry and well drained?

11. Are the first floor and basement sufficiently ventilated, or is it possible to obtain sufficient ventilation?

The area of the display room is an important consideration. If both gas and electric appliances are to be displayed much more space is required than if only one class of appliances is to be handled.

Alteration of Existing Stores

In leasing and altering stores for the display and sale of utility appliances, for bill paying and for the demonstration of appliances, it is obvious that the amount of rental to be paid under the terms of the lease has a very important bearing on the character and quality of the store leased.

Taking the rental into consideration, the store leased should permit a layout and arrangement as near as possible to that of a new store in the same location and fulfilling the same requirements with the minimum of alteration.

It is desirable, in altering the store front and refinishing the interior of a leased store, to make the result resemble as closely as possible the other buildings used by the company for the same purpose.

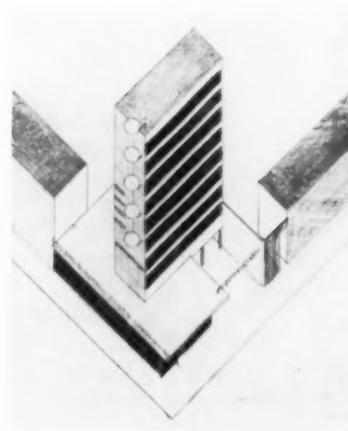
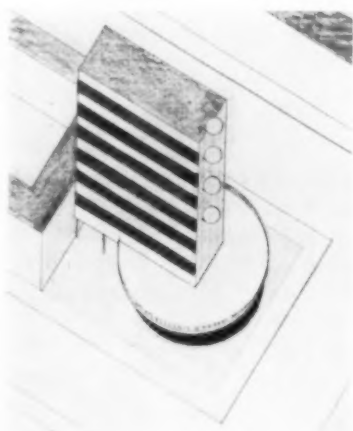
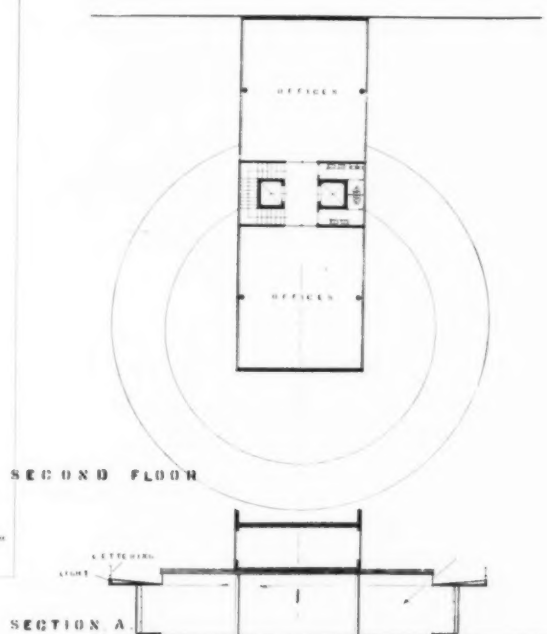
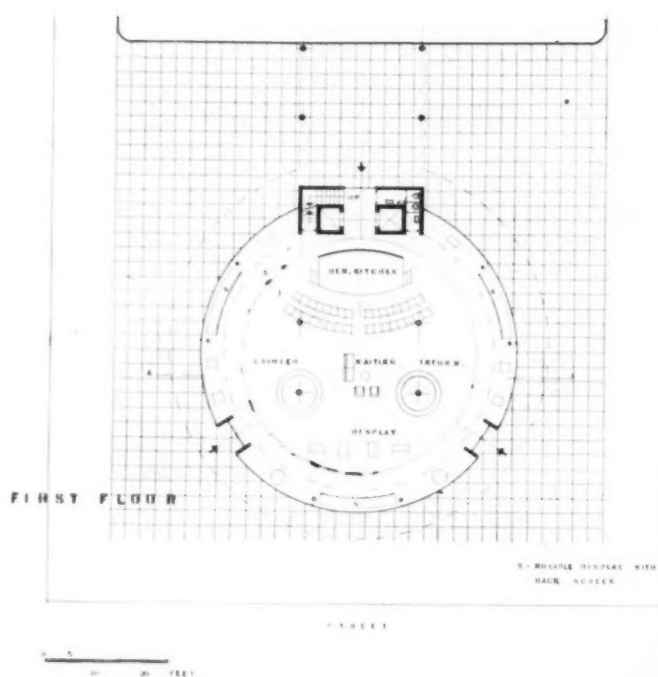
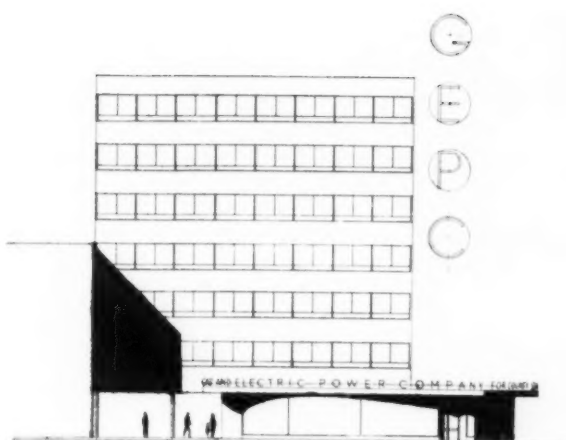
Leased buildings should have adequate heating facilities and few changes should be required except for the relocation of radiators and the installing of concealed radiation in the sales space in place of exposed radiators, or the changing in location of registers in case of a warm-air system.

The same ventilating system is required as for new buildings. Interior toilets having gravity vent ducts only should have wall box fans installed in the partition wall to improve the ventilation. Show windows with solid backs should be ventilated.

On leased buildings, due to the increased power and lighting loads, a new secondary electric service must usually be brought into the building. The switchboard may consist of a wood meter board with main line switches, meters, and so forth, and safety inclosed distributing switches mounted on this board. New circuit panels will have to be installed to take care of the additional capacity required and usually the building will have to be re-wired to conform to the new installation.

Some additional toilet room facilities are usually necessary and the plumbing work must generally be rearranged and augmented to meet as nearly as possible the requirements of a new building.

A SALES AND OFFICE BUILDING DESIGNED BY ALFRED CLAUSS



Perspectives show possible variations of a building combining both general office space and ground floor display space.



REX COLE DISPLAY BUILDING, BROOKLYN, NEW YORK—HOOD AND FOUILHOUX, ARCHITECTS

ARC-WELDED STEEL PLATE WALL

By G. FORTIN, Structural Engineer, Hegeman-Harris Co.

The Rex Cole Display Building in Brooklyn, New York, presents a departure in exterior wall construction. These walls were made of steel plates, arc-welded at the seams, and insulated on the interior surfaces. Plaster was applied on a plaster board set a few inches away from the plate insulation. For reasons of economy and design, the architects, R. M. Hood and J. A. Fouilhoux, selected this wall in preference to masonry.

The construction of all exterior walls consisted of $\frac{1}{8}$ " steel plate, usually 4 feet wide and one story high, supported by vertical 4" channel struts, spaced 2 feet on center. These struts in turn were bolted to the main steel frame of the building.

All interior surfaces of the steel plate were covered with $1\frac{1}{2}$ " thickness of "Sprayo Flake" insulation, a combination of asbestos and paper, mixed in a bituminous mastic and sprayed on with a gun. On the interior flanges of the 4" channel struts a 1" x 2" wood nailing strip was attached to receive a $\frac{1}{2}$ " thick Johns-Manville plaster lath, leaving a $2\frac{1}{2}$ " air space between it and the steel plate insulation. On the interior face of the plaster lath the customary coats of plaster were applied for a finished surface.

The steel plates were bolted to the channel struts

approximately every 12 inches for erection purposes and to avoid buckling during welding. A $\frac{1}{8}$ " clearance was left between all steel plates at the joints to allow for arc-welding.

The arc-welding served the four-fold purpose of:

- (a) Holding the plates in place.
- (b) Waterproofing the exterior wall.
- (c) Making exterior walls perfectly smooth.
- (d) Caulking the openings.

Buckling was avoided by using plates no thinner than $\frac{1}{8}$ inch, and by bolting all joints to struts.

All the steel received the customary shop coat of paint (except at the edges of each plate where the arc-welding occurred) but the exterior exposed surfaces of the steel received an additional coat of red lead and two coats of finish paint. Some of the welded joints were buffed smooth and completely concealed by the paint; others were not buffed, where it was desirable to show plate contours.

No expansion joints were necessary anywhere because it was estimated that due to extreme temperature changes, the building (68 feet in length) would expand or contract only $1/16$ inch.

The insulating properties of this wall were found entirely satisfactory.

The whole wall is just as resistant to heat or cold as the customary 12 inch masonry wall.

*A paper submitted for Second Lincoln Arc Welding Prize Competition, sponsored by Lincoln Electric Co.



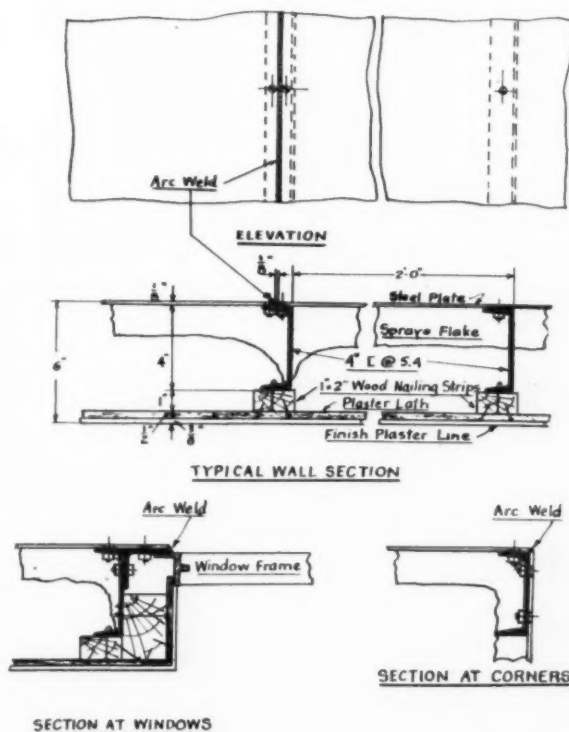
REX COLE DISPLAY BUILDING, BROOKLYN, NEW YORK—HOOD AND FOUILHOX, ARCHITECTS

The following is a comparative study of costs between this welded steel plate exterior wall and a typical 12 inch masonry wall:

<i>Steel Plate Wall</i>	Total Cost	Cost per sq. ft.
Steel plate and supporting struts in place	\$4,100	\$0.912
Arc-welding and grinding of all joints of exterior plate	550	0.122
"Sprayo-Flake" applied	450	0.100
Laying 1" x 2" nailing strips for support of plaster lath ..	135	0.030
Johns Manville plaster lath in place	500	0.111
Painting exterior plate, one coat of red lead, two coats finish paint	135	0.030
Total Costs	\$5,870	\$1.305
<i>12-Inch Masonry Wall</i>		
Total Costs		\$1.570
Net difference in costs between the two types of wall		\$0.265

Plastering costs have purposely been ignored because they are practically the same in both cases.

The arc-welded steel type of wall shows a saving of 26½ cents per vertical square foot of wall, over



the customary masonry construction, or a saving of about 20%. There is also a considerable saving in weight: 11 lbs. per vertical square foot of steel plate wall as opposed to 120 lbs. for 12" thickness of brickwork and mortar.

LEAKY BRICK WALLS

AND HOW TO PREVENT THEM

By JOHN H. MALLON

Louisville Cement Company, Inc.

Few problems facing the building industry today present less information and more misinformation than the causes of leaky brick walls. So far as can be ascertained, there are only three or four places where any scientific work has been done on the subject.

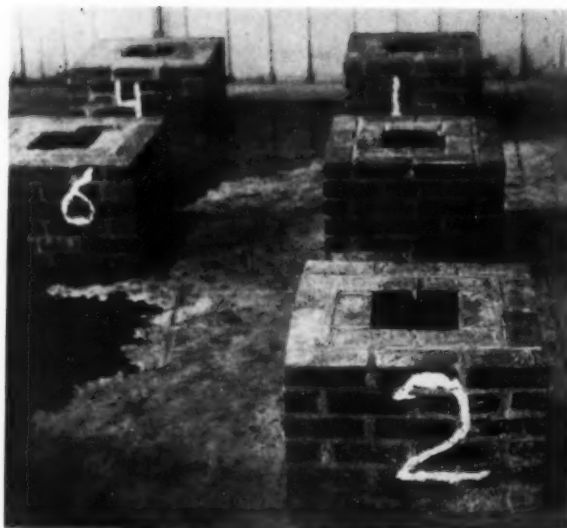
At the Mellon Institute in Pittsburgh, Dr. F. O. Anderegg spent several months on the problem, working for the Eastern Face Brick Association. At the Bureau of Standards, Mr. L. A. Palmer is now working on the Masonry Mortar Research Fellowship, sponsored by the American Face Brick Association, the National Lime Association, and several manufacturers of masonry cements. At Massachusetts Institute of Technology, Prof. W. C. Voss has started an extended research program. At Richmond, Virginia, tests have been made by the Robb & Moody Laboratory, sponsored by the Builders Exchange of Richmond in collaboration with the A. I. A. and the A. G. C., together with some brick manufacturers, material dealers and others.

Reservoir Tests of Louisville Cement Co.

The Louisville Cement Co. during the past few years has engaged in a study of causes of leaky brick walls. At the instigation of a firm of St. Louis architects who were considering several different mortars for a new building, experiments were begun. For comparison we decided to build a small brick reservoir with each mortar, using brick like those under consideration. After thirty days the reservoirs were to be filled with water and the results recorded.

Reservoirs were about 18" high (six courses); 8" thick, with no headers running through wall; and 25" square by outside measurement. Inside openings were approximately 9" square. All joints were $\frac{1}{2}$ " thick.

Each reservoir was built on a piece of sheet iron, and hot pitch was poured into the bottom until the lowest mortar joint was covered, thus preventing the water from leaking out between the bottom of the reservoir and the iron base. On the inside face of the reservoir the joints were struck to represent the outside of an exterior wall. On the outside face they were cut flush. End joints were shoved and the walls carefully slushed so that all joints were full. Every precaution was taken so that poor workmanship would not contribute to any leaking.



Typical brick reservoirs built for water penetration experiments. Various brick and mortars were used. Thirty days after being constructed, the reservoirs were filled with water and the results recorded.

First Test

When we started these experiments, we had an idea that, except where design and workmanship were to blame, wet walls were caused by the use of a hard brick with low absorption, and that leakiness could be prevented by using a brick with good absorption.

The architects for whom we were running this test were considering a comparatively hard burned brick for their job. At the same time a check series of reservoirs were built, using the same mortars but a more porous brick with higher absorption.

At the end of thirty days we turned a hose into the reservoirs and observed the results. Practically all the reservoirs built with the hard brick leaked immediately, and each reservoir built with the softer brick, regardless of the mortar used, held water indefinitely.

Second Reservoir Test

We were convinced now that the problem of leaky walls could be solved if we ran an elaborate test with a wide range of brick to determine with just what kind of brick the reservoirs would hold water and with what kind they would leak.

Eight different brick were selected. Among these were the two bricks we used in the first test: Brick number 3 and Brick number 5.

With each kind of brick we built six reservoirs, using six different mortars. The mortars represented such a wide range of mixes that almost any mortar encountered on any job would at least approach the proportions of one of the mortars used in the test.

Mortars Used:

Mortar A.	90% Portland, 10% Hydrate, by vol.
Mortar B.	75% Portland, 25% Hydrate, by vol.
Mortar C.	50% Portland, 50% Hydrate, by vol.
Mortar D.	100% Mason Cement by vol.
Mortar E.	25% Portland, 75% Hydrate, by vol.
Mortar F.	100% Hydrate, by vol.

The mix for all mortars was one part cementing material to three parts Ohio River sand, measured by volume. The sand for all reservoirs came from the same batch, and was the same kind used in the first reservoir tests.

The 48 reservoirs were built, and we waited thirty days for them to cure. Then we turned the hose into the reservoirs and made our observations.

Observations

Again we found that all mortars acted alike. If a reservoir made of a given brick leaked with one mortar, it leaked with all mortars and if a reservoir with a given brick held water with one mortar, it held water with all mortars.

Again we found that each reservoir holding water did so indefinitely. At the end of 48 hours, when we siphoned out the water, there was still no leakage. The reservoirs held a 16" to 18" head of water, and according to Dr. Anderegg, a 3" head of water is equivalent to rain driven by a 120-mile per hour wind.

Again we found that the reservoirs that leaked did so immediately. With most of them the water came through and trickled down the outside even before the reservoir could be filled with a hose. In so short a time the water could not possibly have soaked through the brick or through the mortar. There must have been small openings and cracks between the brick and the mortar, where the mortar had not bonded with the brick, and through which the water could seep. Later, in order to trace the passage of the water through the reservoirs, some were filled with a stain, Gentian Violet,

which was left in the reservoirs for fifteen minutes and then siphoned out. Then these reservoirs were knocked apart and samples taken from the wreckage. The path of the water through the reservoirs between the brick and the mortar could be clearly traced by the discoloration left by the stain. It showed clearly on the surface but left no mark on the inside of the brick or the mortar.

New findings were observed. Brick number 5, the very brick which in the first series of tests had held water with all the mortars, in the second series now leaked with all mortars. And brick number 3, the brick which in the first series of tests had leaked with all mortars, in the second series of tests now held water with all mortars. These two diametrically opposed results indicate that certain important, unknown variables were not controlled in these tests. These variables determined whether or not a tight bond could be secured by the use of a soft brick or a hard brick.

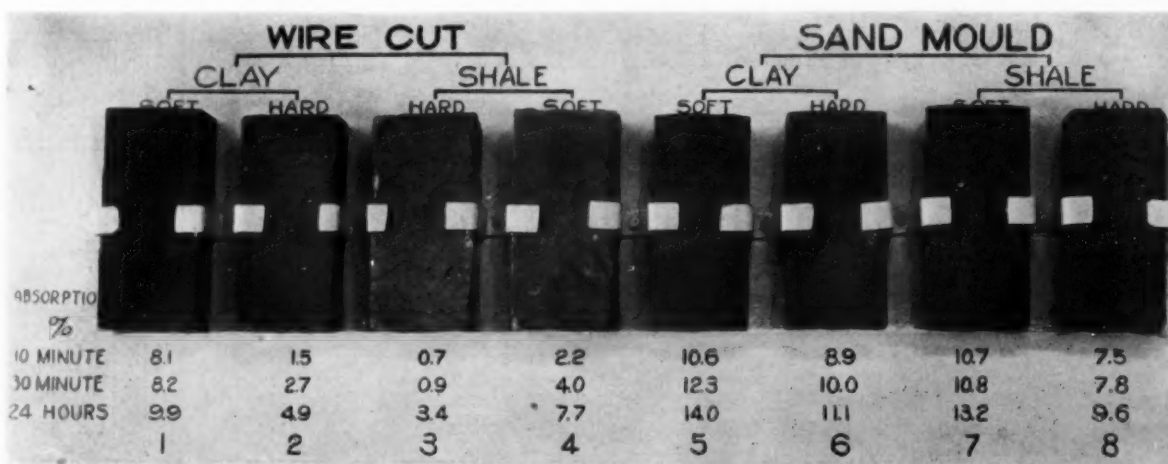
Conclusions

(1) Water does not soak through the brick or through the mortar, but enters through openings and cracks between the brick and mortar where a close bond does not exist. All those who have studied the problem are unanimous in this opinion. (1, 3, 10, 16)*

(2) No particular type of mortar causes leaky walls. In every case all mortars gave identical results when used with the same brick.

(3) The same combination of brick and mortar which under one set of conditions will give a perfect bond and a dry wall under slightly different conditions may allow the penetration of water. Practical experience confirms this conclusion. We know that sometimes the same contractor, with the same brick, the same mortar, the same good workmanship, and with all other conditions apparently the same, will get on one job a watertight wall, but on the very next job he will get a wall that leaks.

*Numbers refer to papers in list of references at end of this article, page 34, advertising section.



Brick used in water penetration experiments.

RESULTS OF MOISTURE PENETRATION TESTS

BRICK	Mortar A. 90% Port. 10% Hyd.	Mortar B. 75% Port. 25% Hyd.	Mortar C. 50% Port. 50% Hyd.	Mortar D. 100% Mason's Cement	Mortar E. 25% Port. 75% Hyd.	Mortar F. 100% Hydrate
1 CLAY SOFT	1 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 12 1/2" Down 4 Hr. 14 1/2" " 18 Hr. Empty Bad	9 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 9 1/2" Down 3 1/2 Hr. 11" " 17 1/2 Hr. 12" " 22 1/2 Hr. 12" " Bad	17 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 7" Down 3 Hr. 9" " 17 Hr. 11" " 22 Hr. 11" " Bad	25 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 8 3/4" Down 2 1/2 Hr. 11 1/2" " 16 1/2 Hr. 14 1/2" " 21 1/2 Hr. 14 1/2" " Bad	33 3 Min. Small Leaks 1/2 Hr. Bad Leaks 1 Hr. 5" Down 2 1/4 Hr. 6 1/2" " 16 1/4 Hr. 9 1/2" " 21 1/4 Hr. 9" " Bad	41 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 12 1/2" Down 2 Hr. 14" " 16 Hr. Empty Bad
2 CLAY HARD	2 3 Min. 3 Small Leaks 1/2 Hr. Leaks Stopped 1 Hr. 3 1/2" Down 4 Hr. 4 1/4" " 18 Hr. 5" " 23 Hr. 5" " Practically No Leaks	10 3 Min. Leak under Bottom Course Probably Bottom not properly caulked 1/2 Hr. Small Leaks 1 Hr. 3" Down 3 1/2 Hr. 5" " 17 1/2 Hr. 11" " 22 1/2 Hr. 11" " Practically No Leaks	18 3 Min. 1 Very Small Leak 5 Min. Practically Stopped 1/2 Hr. No Leaks 1 Hr. 2 1/4" Down 3 Hr. 2 3/4" " 17 Hr. 3 1/2" " 22 Hr. 3 1/2" " Practically No Leaks	26 3 Min. No Leaks 1/2 Hr. No Leaks 1 Hr. 2 1/4" Down 2 1/2 Hr. 3" " 16 1/2 Hr. 3 1/4" " 21 1/2 Hr. 3 1/2" " No Leaks	34 3 Min. No Leaks 1/2 Hr. No Leaks 1 Hr. 2 1/4" Down 2 1/4 Hr. 3" " 16 1/4 Hr. 3 3/4" " 21 1/4 Hr. 4" " No Leaks	42 3 Min. No Leaks 1/2 Hr. No Leaks 1 Hr. 3" Down 2 Hr. 3 1/2" " 16 Hr. 5 1/2" " 21 Hr. 7 1/2" " No Leaks
3 SHALE HARD	3 3 Min. 1 Small Leak 12 Min. Leaks Stopped 1 Hr. 3" Down 4 Hr. 3" " 18 Hr. 4" " 23 Hr. 4" " Practically No Leaks	11 3 Min. 1 Small Leak on Bottom Course 1/2 Hr. Small Leak Bottom Course 1 Hr. 2 1/4" Down 3 1/2 Hr. 3 1/2" " 17 1/2 Hr. 5 1/2" " 22 1/2 Hr. 5 1/2" " Practically No Leaks	19 3 Min. No Leaks 1/2 Hr. No Leaks 1 Hr. 2 1/4" Down 3 Hr. 3" " 17 Hr. 4" " 22 Hr. 4" " No Leaks	27 3 Min. 1 Leak 1/2 Hr. Very Small Leak 1 Hr. 2 1/2" Down 2 1/2 Hr. 3" " 16 1/2 Hr. 4" " 21 1/2 Hr. 4 1/4" " Practically No Leaks	35 3 Min. 1 Small Leak under Bottom Course apparently poor caulking 1/2 Hr. Same as above 1 Hr. 2 1/2" Down 2 1/4 Hr. 3" " 16 1/4 Hr. 4 1/4" " 21 1/4 Hr. 4 3/4" " Practically No Leaks	43 3 Min. No Leaks 1/2 Hr. No Leaks 1 Hr. 2 1/2" Down 2 Hr. 3" " 16 Hr. 6 1/2" " 21 Hr. 7 1/2" " No Leaks
4 SHALE SOFT	4 3 Min. 1 Leak on Bottom Course 12 Min. Leaks Stopped Except Small Leak Bottom Course 1 Hr. 3 1/2" Down 4 Hr. 4 1/2" " 18 Hr. 5 1/2" " 23 Hr. 5 1/2" " Practically No Leaks	12 3 Min. 1 Small Leak on Bottom Course 1/2 Hr. Small Leaks 1 Hr. 4 3/4" Down 3 1/2 Hr. 9 1/4" " 18 Hr. 12" " 22 1/2 Hr. 12" " Good	20 3 Min. 2 or 3 Leaks 1/2 Hr. Small Leaks only 1 Hr. 5" Down 3 Hr. 8" " 17 Hr. 10" " 22 Hr. 10 1/4" " Good	28 3 Min. 3 Small Leaks 1/2 Hr. Very Small Leak 1 Hr. 3 3/4" Down 2 1/2 Hr. 6 1/4" " 16 1/2 Hr. 11" " 21 1/2 Hr. 12" " Good	36 3 Min. Small Leaks 1/2 Hr. 1 Small Leak 1 Hr. 4" Down 2 1/4 Hr. 5" " 16 1/4 Hr. 6 1/2" " 21 1/4 Hr. 6 3/4" " Practically No Leaks	44 3 Min. Bad Leaks 1/2 Hr. Bad Leaks 1 Hr. 4 1/2" Down 2 Hr. 5 1/2" " 16 Hr. 10" " 21 Hr. 10 3/4" " Bad
5 CLAY SOFT	5 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 13" Down 4 Hr. Empty Bad	13 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 11 1/2" Down 3 1/2 Hr. 14 1/2" " 17 1/2 Hr. Empty Bad	21 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 13" Down 3 Hr. Empty Bad	29 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 11 1/2" Down 2 1/2 Hr. 13" " 16 1/2 Hr. Empty Bad	37 3 Min. Small Leaks 1/2 Hr. Bad Leaks 1 Hr. 5" Down 2 1/4 Hr. 7 1/2" " 16 1/4 Hr. 10" " 21 1/4 Hr. 10 1/2" " Bad	45 3 Min. Bad Leaks 1/2 Hr. Bad Leaks 1 Hr. 9 1/2" Down 2 Hr. 12" " 16 Hr. Empty Bad
6 CLAY HARD	6 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 12 1/2" Down 4 Hr. 14 1/2" " 18 Hr. Empty Bad	14 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 9" Down 3 1/2 Hr. 12 1/2" " 17 1/2 Hr. Empty Bad	22 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 6 1/2" Down 3 Hr. 8 1/2" " 17 Hr. 10" " 22 Hr. 10" " Bad	30 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 10" Down 2 1/2 Hr. 13" " 16 1/2 Hr. Empty Bad	38 3 Min. Bad Leaks 1/2 Hr. Very Bad Leaks 1 Hr. 7" Down 2 1/4 Hr. 8 1/2" " 16 1/4 Hr. 12" " 21 1/4 Hr. 12" " Bad	46 3 Min. Bad Leaks 1/2 Hr. Bad Leaks 1 Hr. 12 1/2" Down 2 Hr. 13" " 16 Hr. Empty Bad
7 SHALE SOFT	7 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 12 1/2" Down 4 Hr. 14 1/2" " 18 Hr. Empty Bad	15 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 9 1/2" Down 3 1/2 Hr. 13" " 17 1/2 Hr. Empty Bad	23 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 13 3/4" Down 3 Hr. Empty Bad	31 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 12" Down 2 1/2 Hr. Empty Bad	39 3 Min. Bad Leaks 1/2 Hr. Bad Leaks 1 Hr. 8 3/4" Down 2 1/4 Hr. 10 1/2" " 16 1/4 Hr. Empty Bad	47 3 Min. Bad Leaks 1/2 Hr. Bad Leaks 1 Hr. 10 3/4" Down 2 Hr. 12" " 16 Hr. Empty Bad
8 SHALE HARD	8 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 10" Down 4 Hr. 11 1/4" " 18 Hr. 13" " 23 Hr. 13 1/2" " Bad	16 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 9" Down 3 1/2 Hr. 13" " 17 1/2 Hr. Empty Bad	24 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 7" Down 3 Hr. 10 1/2" " 17 Hr. 12 1/2" " 22 Hr. 12" " Bad	32 3 Min. Bad Leaks 1/2 Hr. Leaking Badly 1 Hr. 9" Down 2 1/2 Hr. 12 1/2" " 16 1/2 Hr. Empty Bad	40 3 Min. Bad Leaks 1/2 Hr. Bad Leaks 1 Hr. 10" Down 2 1/4 Hr. 13 1/2" " 16 1/4 Hr. Empty Bad	48 3 Min. Bad Leaks 1/2 Hr. Bad Leaks 1 Hr. 8 1/2" Down 2 Hr. 10" " 16 Hr. 14" " 21 Hr. 14" " Bad

Just what the conditions are that cause this difference no one has yet determined.

Precautions Recommended

It is important that every possible precaution be taken not only to secure a good bond, but also to prevent the water from going through the wall in case a good bond is not obtained.

Based not so much on the results of our own tests as upon a study of buildings with brick walls that leak, reports of research work, and articles by others on the subject, the following recommendations are submitted. A reasonable observance of them will, we are confident, insure dry walls. They can be conveniently grouped under five headings in the order of their importance:

1. Workmanship.
2. Design.
3. Type of Joint.
4. Brick.
5. Mortar Materials.

Good Workmanship

As every architect knows, the most frequent cause of leaky walls is simply poor workmanship—insufficient mortar in the wall, especially in the head joints. Those who have studied the subject are unanimous in this opinion. (1, 5, 6, 7, 10, 11)

Dr. Anderegg, for instance, says: "Upon the bricklayer's workmanship, more than upon any other single factor rests the responsibility for the integrity of the wall."

L. A. Palmer says: "Neglecting to fill the head joints is the most prevalent cause of moisture transmission."

The Common Brick Manufacturers Association submits convincing evidence. The accompanying illustration, published by the Association, shows a close-up of an 8" wall built with uninspected workmanship. A casual glance shows that there is actually very little mortar in the wall. They report: "This picture reveals some of the underlying causes of leaky walls."

Good workmanship should insure full head joints, preferably shoved joints, and careful bedding of the headers. Inside longitudinal joints which parallel the face of the wall should be

slushed full of mortar. Many architects are now specifying that the face brick be backplastered before the back-up units are laid. The resulting solid sheet of mortar behind the face brick acts as an effective barrier to any water which may find its way past the outside four inches of the wall.

Proper Design

Even where workmanship is above average, leaky walls sometimes occur. In such cases improper design or construction details are often responsible.

It should be unnecessary to emphasize the importance of so designing the building that water will not concentrate against any part of the wall, or the importance of proper flashing under copings, brick sills, projecting belt courses and trim, especially if the materials used are not impervious, or if the joints cannot be made tight. And yet these obvious precautions are sometimes neglected. (1, 6, 9, 12, 13, 15) John E. Nicholson, of Nicholson & Galloway, New York waterproofing engineers, goes so far as to say: "No matter how good the material and workmanship may be, wall saturation will always occur. The important thing to do is to flash the wall at all doubtful places."

An added precaution is to backplaster the inside



Detail of 8" brick wall built with uninspected workmanship.



Battery of brick reservoirs used for tests.

RECOMMENDED PRECAUTIONS IN BRICKWORK

Good Workmanship

Full head joints—preferably shoved.
Careful bedding of headers.
Full inside longitudinal joints which parallel the face of the wall.

Proper Design

Prevent concentration of water against wall.
Proper flashing.
Inside face of wall covered with dampproofing or plastered with waterproofed mortar.

Type of Mortar Joint

Tooled finish—preferably concave or V-shaped.
Thin joints.

Brick

Avoid brick with extremely high and extremely low absorption.
Use absorbent back-up units.

Mortar Materials

Plasticity.
High water-retaining capacity.
Integral stearate waterproofing.

face of the wall with a coat of waterproofed mortar, or to apply a coat of dampproofing to the inside face.

Type of Mortar Joint

One of the best precautions is to select the proper type of mortar joint. A tooled finish, preferably concave or V-shaped, is strongly recommended. The importance of this can not be overemphasized. (1, 9, 10, 11, 13)

Stanley Newman, a Boston waterproofing engineer, advances this sound argument: "Cut flush and raked joints, while they may improve the appearance of a wall surface by adding color and texture, are so difficult to construct properly that we recommend their elimination for buildings accessible to wind-driven rain. It has been our experience that in forming cut flush and raked joints, the tendency is to open up the body of the mortar and to draw the mortar away from the units. The joints that afford the best protection are those of the weathered and concave type. These not only present an excellent surface for the shedding of water, but require for their formation an amount of pressure sufficient to compress the mortar and create a firm bond between the mortar and the brick at the face of the wall, thereby reducing the probability of hidden cavities."

The use of excessively thick mortar joints should

be avoided. (10, 13) All mortars shrink slightly when they dry out. This may cause trouble in the head joints, if the joint is too thick.

Brick

Many persons think that it is difficult to get a good bond with a highly impervious brick, especially if it is wet. (5, 6, 7, 8, 9, 11) For instance, P. H. Bevier, Engineer of the Hollow Tile Manufacturers Association has said: "The porosity and absorption or suction of a brick effects its bond to the mortar. It is desirable to have a brick with a moderately high absorption that will not only absorb the water in the mortar but take up some of the fine cement, which, entering the pores of the brick, creates a firm bond. Hard, smooth, non-porous brick effects very little bond with the mortar, in which case there will be found invariably cracks between the brick and the mortar through which water can enter."

But it is certainly true that a brick with too high a rate of absorption is apt to prevent a bond in hot, dry weather unless it is generously wet. (1, 7, 10, 11, 14) As Dr. Anderegg says: "If the absorption is too rapid, so much of the moisture is removed from the mortar in contact with the dry brick that the mortar congeals on coming in contact, has no chance to spread out evenly over the surface, has inadequate opportunity to make thorough contact and bonds poorly." And so, brick with a high rate of absorption must have their excessive sucking power diminished by wetting before they are laid, especially in hot dry weather.

Everything considered, it seems wise in choosing a brick to avoid both extremes. Sometimes, however, impervious face brick must be used. In such cases it is important to use, for backing up the face brick, masonry units which have quite a little absorption. If any water penetrates beyond the face brick, these softer units, acting somewhat like a sponge, will absorb and hold back the moisture which would otherwise pass through to the inside of the wall. Later, when the sun hits the face of the wall, this moisture will evaporate out again, almost as though the wall were breathing. (1, 10)

Mortar Materials

Compared with the precautions so far mentioned, mortar materials play a minor part in causing or preventing leaky walls. (6) For best results, however, there are certain characteristics which mortar should have to insure a good initial bond and a tight joint.

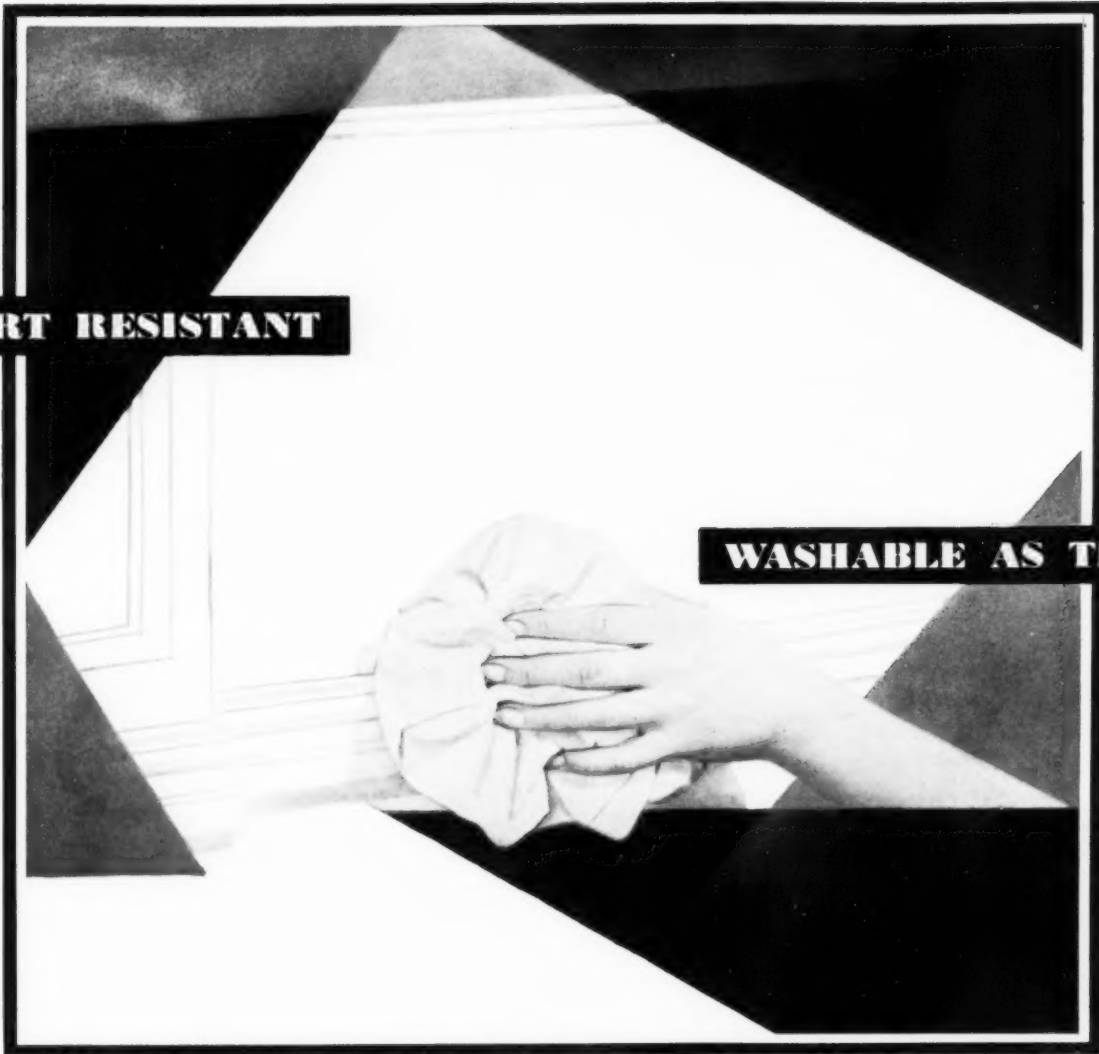
Mortar should be plastic, so it will spread out evenly, permitting a more complete bedding of the brick and an increased area of contact between the surface of the brick and the mortar, and so that the longitudinal joints which parallel the face of the wall will be completely filled when mortar is slushed into them. (1, 4)

Mortar should have high water-retaining capacity.

(Continued on page 32, advertising section)

DIRT RESISTANT

WASHABLE AS TILE



YEARs of use in public buildings, offices and institutions, where good looks and practical qualities alike are essential, have proved the value of interiors painted with Barreled Sunlight.

Such interiors are lastingly bright . . . clean . . . cheerful. And they are easily . . . economically maintained.

A damp cloth quickly removes accumulated dust, smudges and finger prints from Barreled Sunlight surfaces; satin smooth, flawless, they have no minute cracks or recesses to catch and hold dirt.

Remarkably durable, Barreled

Sunlight stands up under repeated washings. In addition to saving cleaning labor, it materially reduces the need of repainting.

Because it is an all-oil product, Barreled Sunlight may be tinted in a variety of pleasing colors to harmonize with interior surroundings. Tinted, it retains its washable qualities . . . rich depth.

Our catalog in Sweets will give you complete information. For your own files, let us send you our booklet, "For In-

teriors of Lasting Beauty and Cleanliness." Write U. S. Gutta Percha Paint Company, 22-L Dudley Street, Providence, R. I. Branches or distributors in all principal cities. (For Pacific Coast, W. P. Fuller & Company.)



Barreled Sunlight is now available in two forms, Interior and Outside. Write for complete information on Outside Barreled Sunlight—its more pronounced whiteness, richer lustre and marked durability. (Note that both forms of Barreled Sunlight are readily tinted any desired shade.)

Barreled Sunlight

REG. U. S. PAT. OFF.



BUILDING TRENDS AND OUTLOOK

By L. SETH SCHNITMAN

The October contract total for construction in the 37 Eastern States aggregated \$107,473,900 and contrasted with \$127,526,700 for September and \$242,094,200, for October, 1931. Declines from September, 1932, were sustained in each of the four major structural classifications, except public utilities. Residential building showed a contraction from the September contract total amounting to about 4 per cent; nonresidential building suffered a decline of about 25 per cent; public works declined about 22 per cent; and the value of public utilities contracts was almost double that reported for September.

For the elapsed ten months of 1932 total construction contracts aggregated \$1,164,837,100 as contrasted with \$2,804,802,000 for the corresponding period of 1931. Relatively, residential building and public utilities suffered more than did either nonresidential building or public works. The residential total for the year to date, amounting to \$247,865,100 compares with \$729,934,800 for the corresponding ten months of 1931. Nonresidential contracts during the elapsed period of the current year aggregated \$424,199,900 in contrast with \$1,002,261,800 for the same period a year ago. Public works contracts during the first ten months of 1932 totaled \$427,737,600 as against \$797,140,600 for the corresponding period of 1931; and contracts for public utilities showed a total of \$65,034,500 as compared with \$275,464,800 for the corresponding ten months of 1931.

MATERIAL PRICE MEASURING ROD*

The prices in this tabulation enable one to visualize at a glance the main trend of the material market.

Their significance does not extend beyond that point, and the explanation under them should be read carefully.

F. W. Dodge Corporation Composite Prices as Indicated in Explanation—

Material	This Month	Month Ago	Year Ago
Portland Cement...	\$2.03	\$2.03	\$1.95
Common Brick....	11.75	11.75	12.00
Structural Steel...	1.60	1.60	1.60
Lumber.....	15.50	15.52	16.71

Prices given in this comparison are composite and do not in all cases refer to one item. For instance, the price of structural steel is the composite of prices of shapes and plates f.o.b. Pittsburgh; the price of lumber is a composite of five items of Southern pine and five items of Douglas fir f.o.b. mill; the price of cement is a composite of prices in fourteen different cities per barrel, carload lots, to contractors; price of brick is composite in fourteen cities per M, delivered on the job.

*As previously published in *General Building Contractor*.

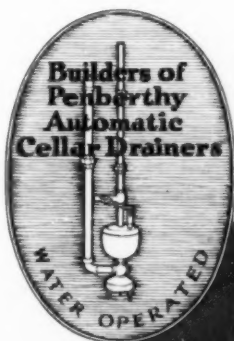
IT STANDS ALONE

in its
excellence of design
quality of materials

high grade
workmanship

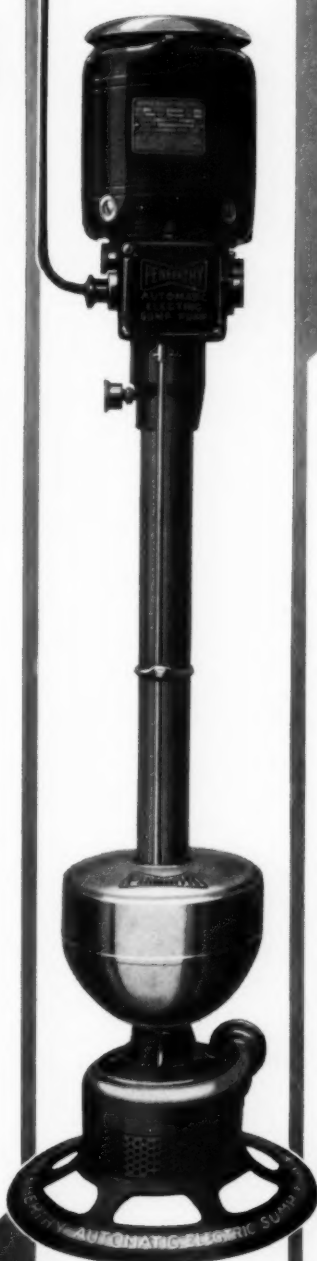
performance

dollar value



**COPPER
AND BRONZE
THROUGHOUT**

No. 1 K



LIST PRICE
\$65⁰⁰

¼ h. p. repulsion-
induction motor.
Maximum capacity
3600 gal. per hour.



If you will examine the Penberthy Model K Sump Pumps and make your own comparisons, you will invariably come to the conclusion that these Model K Pumps have no close rivals—that they stand alone.

Limited space does not permit listing all features of these Model K Pumps, but your attention is directed particularly to the following:

1. Rustproof because of copper and bronze construction throughout.
2. Exceptionally rugged ¼ h.p. repulsion-induction motor having ball thrust bearing for vertical operation.
3. Circuit breaker that protects motor against damage from overloading or improper voltage.
4. Mercury switch that assures dependable operation.

Penberthy Model K Automatic Electric Sump Pumps are made in five sizes for any sump depth up to 8 feet 6 inches. They are carried in stock by jobbers everywhere.

PENBERTHY INJECTOR CO.

Established in
1886

DETROIT

Canadian Plant
Windsor, Ont.

PENBERTHY SUMP PUMPS

WAGE SCALES IN THE BUILDING TRADES

Information Furnished by National Association of Builders Exchanges and Compiled by Division of Statistics and Research,
F. W. Dodge Corporation, as of November 15, 1932

	Asbestos Workers	Bricklayers	Bricklayers' Tenders	Carpenters	Cement Finishers	Electricians	Hoisting Engineers	Iron Workers —Ornamental	Iron Workers —Structural	Laborers	Lathers	Painters	Plasterers	Plasterers' Tenders	Plumbers	Roofers— Composition	Roofers— Slate & Tile	Sheet Metal Workers	Steamfitters	Stone Masons	Tile Setters	Tile Setters' Helpers
Akron.....	\$1.00	\$1.25	\$0.40	\$0.70	\$0.70	\$0.75	\$0.70	\$0.60	\$0.60	\$0.40	*\$0.87½	\$0.65	*\$1.20	\$0.62½	\$0.85	\$0.80	\$0.80	\$0.80	\$0.85	*\$1.25	*\$1.25	*\$0.50
Atlanta.....	1.00	1.25	.45	.70	1.25	.90	1.00	1.85	1.25	.25	1.00	.75	1.25	.30	1.25	.80	.80	1.00	1.25	1.25	1.25	.40
Baltimore.....	1.12½	*1.25	1.00	*1.00	*1.25	*1.43¾	*1.25	*1.65	*1.65	.35	*1.50	*.90	*1.25	1.00	*1.00	1.00	1.00	*1.37½	*1.25	1.25	1.25	.72
Boston.....	1.25	*1.30	.70	*1.17½	1.17½	*1.37½	1.17½	*1.20	*1.20	.70	*1.25	*1.12½	*1.37½	*.95	*1.25	*1.17½	*1.05	1.17½	*1.25	*1.30	*1.30	*.95
Buffalo.....	1.12½	*1.25		*1.00	1.12½	*1.30		\$49.50 to \$53.00 wk.	1.12½	1.12½	.40	1.12½	*1.00	1.25	1.25	.85	1.10	1.10	*1.25	*1.25	*1.18¾	
Chicago.....	1.37½	*1.37½		*1.31¼	1.31¼	1.50	1.31¼	1.31¼	1.35	82½	*1.37½	*1.41	*1.37½	.88¾	1.37½	1.37½	1.40	1.37½	1.37½	1.37½	1.37½	.96¼
Cincinnati*.....	1.15	1.37½	.70	1.20	1.02½	1.25	1.25	1.25	1.25	.45	1.31¼	1.10	1.37½	.70	1.25	.92½	1.07½	1.07½	1.25	1.25	1.25	
Cleveland*.....	1.17½	1.37½	.72	1.12½	1.12½	1.25	1.12½	1.25	1.25	.72	1.37½	1.12½	1.37½	.72	1.25	1.15	1.37½	1.12½	1.25	1.37½	1.25	.81¼
Columbus.....	1.00	1.30	.62½	1.00	.80	1.00	1.15	1.25	1.25	.40	1.00	.80	1.00	.62½	1.00	.80	1.00	.80	1.00	1.30	1.25	.50
Dallas††.....	10.50	10.00	.50	8.00	10.00	*11.00	10.00	10.00	10.00	.35	10.00	*9.00	*10.00	*.50	12.00	8.00	9.00	*10.00	12.00	10.00	*12.00	†* .75
Dayton*.....	1.25	1.30	.80	1.00	1.15	1.55	1.25	1.35	1.35	.35	1.10	1.00	1.25	.80	1.15½	.85	1.00	1.00	1.15½	1.30	1.50	.60
Denver††.....	9.00	12.00	6.50	10.00	10.00	10.00	10.00	10.00	10.00	4.00	11.00	*10.00	12.00	7.00	11.00	7.00	7.00	9.00	9.50	12.00	10.50	†.62½
Des Moines.....	1.00	1.25	.65	1.00	1.00	1.00	1.00	1.00	1.00	.55	1.00	1.00	1.25	.75	1.25	1.12½	1.12½	1.12½	1.25	1.50	1.25	.80
Detroit.....	1.37½	1.25 max.	.55	.80	.70	1.25	.60	1.00	1.00	.50	.80	1.00	1.25	.80	1.50	.90	1.00	1.00	1.50	1.50	1.25	.80
Duluth.....	.85	1.10	.35	.75	.75	.90	.80	.80	.90	.35	.85	.80	1.10	.70	.95	.70	.70	.80	.95	1.10	1.25	.80
Erie.....	.80	.90	.50	.75	1.00	1.15	1.12½	.60	1.10	.90	.75	.50	.60	.60	.60	.70	1.00	1.00	*1.18¾	1.31¼	1.00	.90
Grand Rapids.....	.65	.80	.40	.60	.65	.90	.75	.80	1.00	.35	.80	.60	.80	.40	.90	.50	.70	.70	.90	1.25	1.25	.50
Houston.....	1.00	1.50		1.00	1.00	1.25	1.00	1.12½	1.12½	.50	1.00	.62½	1.00		1.25	.60	1.25	1.25	1.25	1.00	1.25	
Indianapolis.....	1.32½	1.62½	.90	1.22½	1.17½	1.50	1.37½	1.45	1.45	.45	1.57½	1.25	1.57½	1.00	1.00	.90	1.27½	1.22½	1.50	1.62½	1.50	.60
Kansas City.....	1.05	1.32½	.80	1.12½	1.12½	1.50	1.12½	1.12½	1.12½	.70	1.25	1.12½	1.32½	.80	1.25	.92½	.92½	1.12½	1.25	1.12½	1.25	.75
Los Angeles††.....	10.00	8.00	6.00	7.00	8.00	7.00	8.00	9.00	10.00	4.00	10.00	7.00	9.00	6.00	9.00	7.00	8.00	11.00	8.00	6.00	†.75	
Louisville.....	1.12½	1.25	.50	.90	1.00	1.00	1.00	1.00	1.00	.35	1.12½	.90	1.00	.50	1.12½	.50	.85	.85	1.12½	1.25	1.00	.50
Memphis.....	1.00	1.37½	.50	.87½	.75	1.00	.75	.75	.75	.20	1.00	.75	1.25	.50	1.25	.40	1.12½	1.12½	*1.25	1.37½	1.25	.50
Milwaukee.....	1.00	1.00	.90	.85	1.00	1.25	1.15	1.05	1.05	.50	1.00	1.00	1.00	.90	1.00	1.00	.92½	.92½	1.00	1.00	1.00	.65
Minneapolis.....	1.06¼	1.10	.55	.75	.75	.90	.80	.90	.90	.45	.85	.80	1.10	.70	.95	.70	.70	.80	.95	1.10	1.25	.65
Nashville.....	1.00	1.00	.65	.75	.87½						1.00	.80	1.00	.30		.65	.65	.65	1.25	.90	.65	
New Haven*.....		1.40	.50	.80	.80	1.16¾				.50	.80	.50		.50	1.06¼	.65	1.50	1.06¼	1.06¼	1.40	1.40	
New Orleans.....	.65	.80	.55	.75	1.00	1.25	1.25	1.25	1.25	.35	.75	.90	1.25	.75	1.25	.40	1.15	.90	1.25	1.50	1.25	.35
New York City††.....	11.20	13.20	8.80	11.20	11.20	13.20	13.20	11.20	13.20	6.60	11.20	11.20	12.00	8.50	12.00	10.28	12.62	11.20	11.20	13.20	11.50	8.50
Oakland††.....	7.00	11.00	7.00	7.20	7.20	8.00	9.00	7.20	9.60	5.00	10.00	7.00	8.80	6.00	8.25	7.00	7.00	7.50	8.25	9.00	8.00	5.00
Oklahoma City††.....	8.00	8.00	4.00	8.00	8.00	8.00	8.00	8.00	8.00	3.50	.80	.80	4.00	.80	6.00	6.00	8.00	8.00		11.00	†.62½	
Omaha.....	1.32	1.00	.45	.80	.90	1.00	1.00	.90	.90	.35	1.00	.80	1.00	.45	1.00	.72½	.87½	.87½	1.00	.90	1.00	.60
Philadelphia.....	1.12½	1.50		1.00	1.05	1.25	1.18¾	1.37½	1.37½	.45	1.62½	.80	*1.37½	.90	1.04	1.00	1.25	1.25	1.04	1.00	1.25	6.00
Pittsburgh.....	*1.50	*1.50	*1.25		*1.56¼	1.43¾	*1.37½	1.37½	.70	*1.50	*1.18¾	*1.50		1.50	*1.25	*1.50	*1.31¼	*1.50	*1.40	1.33¼	.88	
Portland, Ore.††.....	8.00	*12.00	4.80	7.20	*7.20	*8.00	9.60	8.80	8.80	7.20	*8.80	7.04	*9.60	*7.20	*8.80	7.20	10.00	*8.00	*8.80	*10.00	10.00	6.00
Reading.....	.70	.90	.75	.75	.85	.75				.35	.75	.70	.85	.75	.90		.80	.80	.90	.75	.90	.50
Richmond.....	.60	1.50	.90	1.00	.80	1.25	1.50	1.50		.50 to	1.25	.70	1.00		1.00	.50	.60	.70	1.00	1.25	1.25	
Rochester.....	1.01¼	1.25	*1.00	*1.12½	*1.15½	1.00	.80	*1.00	.80	.55	1.00	*1.00	*1.25		*1.17½	*.90	*.90	*1.00	*1.17½	*1.25	*1.25	
Salt Lake††.....	6.00	9.00	8.00	7.20	8.00	8.00	9.00	8.00	8.00	4.00	10.00	7.20	10.00	8.00	9.00	7.20	7.20	8.00	9.00	9.00	9.00	†.50
San Antonio††.....	6.00	8.00	2.50	3.00	6.00	6.00	4.00	6.00	6.00	2.00	4.00	6.00	2.00	6.00	5.00		6.00		5.00	8.00	2.00	
San Francisco.....	10.00	12.00	3.50	7.00	10.00	9.00	8.00	8.00	10.00	2.75	7.00	7.00	8.00	3.50	8.00	8.00	8.00	10.00	8.00	12.00	12.00	2.50
San Francisco.....	8.00	11.00	7.00	9.00	9.00	9.00		11.00	5.50	10.00	9.00	11.00	7.50	10.00	8.00	8.00	9.00	10.00		10.00		
Seattle††.....	8.00	9.60	5.28	7.20	7.20	*8.80	8.00	8.00	8.80	4.75	*8.80	*7.20	*9.60	*6.40	*8.80	7.20	7.20	8.00	*8.80	9.60	8.00	
Sioux City.....	.90	1.50		1.00	.75	1.00		1.00	1.00	.40	.60	.90	1.15		1.00	1.00	1.00	.90		1.25	1.00	
St. Louis.....	1.25	1.50	1.00	1.25	1.31¼	1.67½	1.47	1.47	1.47	.78¾	1.25	1.25	1.50	1.06¼	1.43¾	1.17½	1.25	1.25	1.43¾	1.25	1.25	.76½
St. Paul.....	1.18	1.10	.75	.75	.85	.90	.80	.90	.90	.45	.85	.80	1.10	.70	.95	.70	.70	.80	.95	1.10	1.25	
Washington, D.C.	*1.50	1.75	.50	*1.37½	1.25	*1.65	*1.37½	*1.65	*1.65	.75	*1.62½	*1.37	*1.75	*.75	*1.50	*1.37½	*1.37½	*1.50	*1.50	*1.25	*1.50	.75
Wichita.....	.60	1.25	.25	.40	.40	.50	.30	.40	.40	.20	.50	.50	.60	.25	.50	.50	.50	.50	.75	.75	.50	.25
Yonkers††.....	*1.37½	12.00	6.80	10.00	9.00	11.00	10.00	12.00	12.00		12.00	10.00	12.00	6.80	11.00	10.20				10.00		.70

NOTE.—Where two figures are shown they are the minimum and maximum. All figures are for hour rates except as indicated. ††8-hour day. †Rate per hour. *On 5-day week basis.
c Correction. Asterisk after city indicates all trades on five-day week basis.

ABOVE DATA ARE WAGE SCALES AND DO NOT NECESSARILY INDICATE ACTUAL WAGE RATES BEING PAID IN THE RESPECTIVE TRADES.

Modernization

Modernization planning is today an important source of income to the architect. And in that planning, Sealex Linoleum and the new Sealex Wall-Covering are well worthy of consideration. Our Architectural Service Department will cooperate to the fullest extent, furnishing design suggestions for wall and floor decoration, as well as technical advisory service, when desired.

In Sealex Linoleum, we offer a resilient, efficient and durable floor material. In Sealex Wall-Covering, we offer a stain-proof, washable, permanent wall-covering which offers unlimited opportunities for effectively modernizing unsightly old walls.

Sealex materials are widely used in up-to-date, new construction. Therefore, their use in remodeled structures is in no sense a compromise. The ease of application of Sealex materials may be obtained without sacrificing any principle of modern building design.

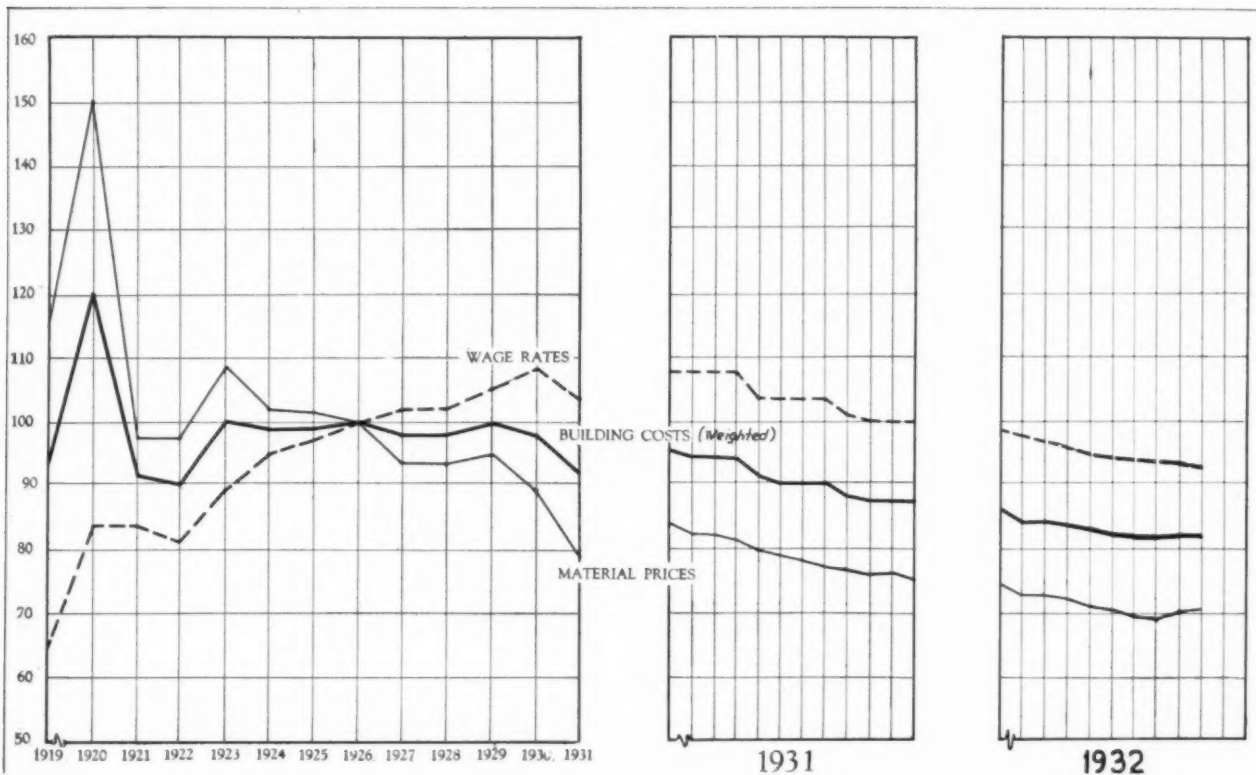
Furthermore, prices of these materials are now at unusually low levels. The architect will do well to call his clients' attention to this fact. Present-day low costs constitute a sound reason for immediate action.

Congoleum-Nairn Inc.

GENERAL OFFICE...KEARNY, NEW JERSEY

MATERIAL PRICES, BUILDING WAGE RATES AND BUILDING COSTS COMPARED

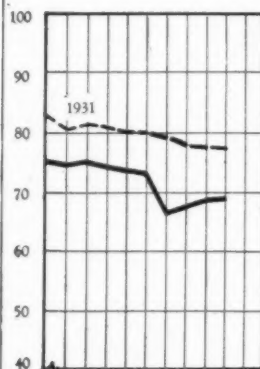
1926 Monthly Average — 100



1931

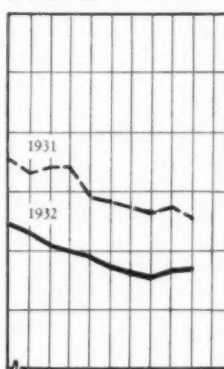
1932

WHOLESALE PRICE INDEXES



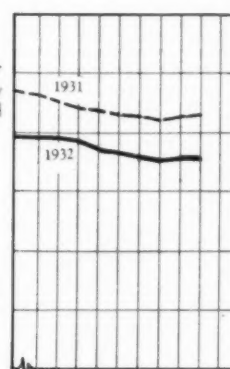
PAINT MATERIALS

It is not probable that any further important recovery in prices looms for nearby future.



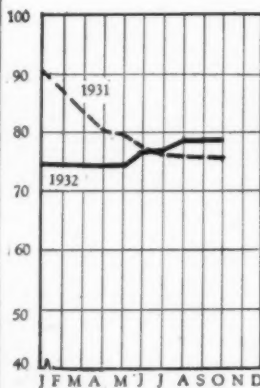
LUMBER

Prices for lumber will do well if they stabilize around current levels.



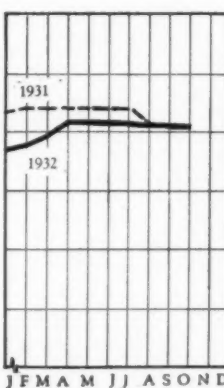
BRICK AND TILE

Further price softness appears likely over next few months.



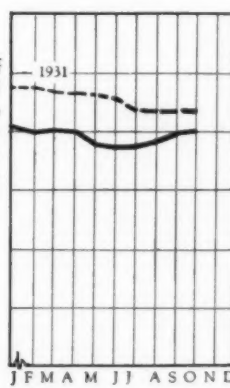
CEMENT

Prices for cement will doubtless undergo severe tests in the nearby months.



STEEL

Present level of structural steel prices cannot be considered as having marked a period of stabilization.

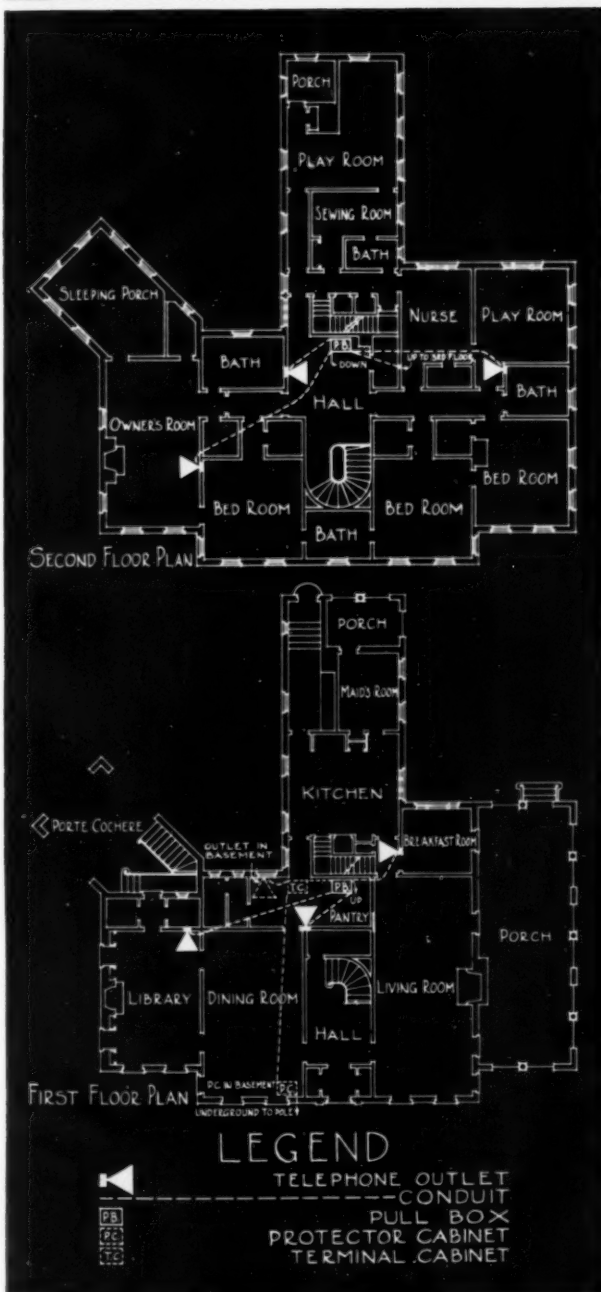


OTHER MATERIALS

Recent betterment in material prices seems to have almost completely spent itself.



The residence of Mr. Donald Ganiard, 714 Michigan Avenue West, Jackson, Michigan, is equipped with built-in telephone conduit connecting eight outlets, including one in the third-floor hall. This provision for greater telephone comfort was made during a remodeling of the residence. CLAIRE ALLEN & SONS, Architects, Jackson.



COMPLETE TELEPHONE CONVENIENCE PROVIDED FOR DURING REMODELING

TELEPHONE convenience makes homes much more livable. Steps, time and tempers are saved when there are enough telephones—in bedroom, boudoir, library, kitchen. The whole household runs more smoothly.

If conduit and outlets were not built in during the original construction to provide for this telephone comfort, they can be added during the remodeling, as was done with the residence above. Telephone conduit, included thus in walls and floors, conceals all wiring, protects against most types of service interruptions, and allows outlets to be located wherever they're wanted.

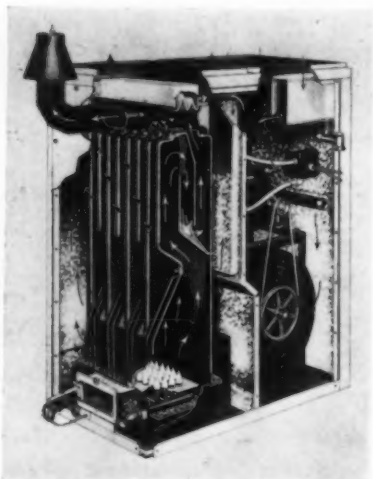
Such conduit layouts should be carefully planned in advance to assure the greatest measure of convenience. Your local telephone company will help you, advise you, without charge. Just call the Business Office and ask for "Architects' and Builders' Service."



NEW PRODUCTS AND EQUIPMENT

SURFACE COMBUSTION FORCED-AIR SYSTEM

A compact, gas-fired heating unit—the Surface Combustion K-series Furnace—has been developed by The Surface Combustion Corporation of Toledo for installation in residences and moderate-sized buildings. The cut-away view illustrates the



method of operation. The heater consists of two separate compartments, one of which contains a cast-iron combustion chamber and heating surfaces. The fan and all controls are located in the other compartment. Each unit burner consists of a series of tips of the 2-stage Bunsen design, each with

a flared top designed to burn a small capacity of gas. At the top of the gathering chamber is a removable humidifying pan. The fan used is the multiblade type. A dry type air filter is located at the air inlet to the fan chamber. Controls furnished with the heater make it entirely automatic in operation. The unit is 49 inches high, 23 inches wide by 38 inches deep.

FIRE TESTS OF VAULT DOORS

The fire resistance of a vault door should be approximately equal to that of the walls. It is often necessary, however, for structural reasons to make the vault walls thicker than fire protection demands, in which case the necessary protection may be had with a door having a lower classification than the wall. The classification of the vault is then, of course, determined by the door rather than the walls.

Vault doors are tested by Underwriters' Laboratories to withstand fire for two, four or six hours up to standard temperatures of 1850°, 2000° and 2150° F. respectively. Doors of less than two hour rating are not recommended for vaults. The value of various types from a fire resistive standpoint must be based on reliable information as to standard tests.

The usual vault door consists of a complete unit comprising a vestibule designed to be built bodily into the vault wall, with a door or doors fitted into the frame. An inner door is considered of some value in keeping well away from the outer door and therefore well inside the vault itself, any combustible material that might otherwise be ignited by radiated heat from the outer.

It is obvious that the door must be so constructed and installed as to withstand shock, impact, settlement of walls or distortion due to heat or mechanical causes. A crack between the door or its frame and the vault wall, because of the admission of heat or flame, may render the vault absolutely useless from a fire protection standpoint. The proper installation of the door, therefore, by responsible and experienced men may be fully as important as the selection of the door itself.

There are two generally accepted methods in use. One is to build the frame into the wall during the erection; the other, preparing a wall spacing somewhat larger than the frame and setting the frame in the opening, completely filling the space between the opening and the vestibule with cement grout. In the latter case, it is well to be assured that the grouting is well and truly done and that the joint is not simply painted with mortar!

When the door is built into the wall great care must be used to see that the contact between the frame and the wall is secure and continuous at all points.

Both fire endurance and hose stream tests are used to determine classification.

SECTIONAL STEEL WALL

The E. F. Hauserman Company of Cleveland has developed a factory-finished sectional steel wall designed to replace the conventional built-up masonry or lathe type. It is known as the Hauserman Masterwall. The construction consists of standard movable



Corridor view of Hauserman "Masterwall."

panels are packed for heat and sound insulation and have a dead air space to increase the normal efficiency of the packing. In addition to giving the same advantages as built-up walls, it is claimed that these sectional walls can be rearranged overnight to meet changing layout requirements. Disassembly and reerection involve no damage or destruction of parts.

• Office of A. L. Powell, Supervising Engineer, Incandescent Lamp Dept., General Electric Company, 405 Lexington Ave., New York. No. 21241 Macbeth "Cremax" Cove Strips used in lighting.



New Beauty IN DECORATIVE LIGHTING

For unusual and individual lighting effects there is nothing that affords more adaptability and beauty than Macbeth Architectural Lighting Elements. They permit new freedom in lighting arrangement and afford unlimited opportunity for blending lighting systems with any architectural or decorative scheme. They are made in three separate forms to cover every requirement for built-in lighting effects . . . Cove Strips for luminous trough-lighting . . . Pressed Glass Plaques, with open grill or decorative effects . . . B & B Illuminating Plates for flush-face or recessed unit lighting in walls or ceiling. • Macbeth Lighting Elements



have been used with unusual success both in the construction of new buildings and in the redecoration of older ones. They are adaptable either to "moderne" or conservative design in offices, theaters, stores, restaurants and almost any type of building. They are available in several patterns, colors and finishes in stock designs, or special shapes can be furnished on request. Write for complete descriptive details and specification data. MACBETH-EVANS GLASS COMPANY . . . Charleroi, Pennsylvania.



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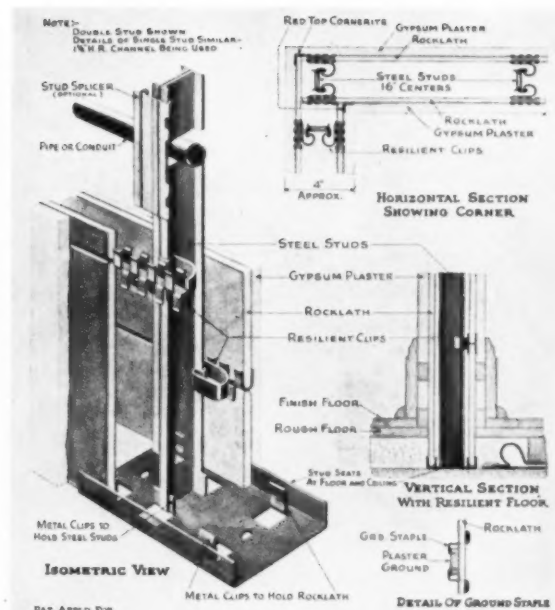
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U. S. G. RESILIENT PLASTERING SYSTEM

This system, developed by U. S. Gypsum Co. of Chicago, is available for fireproof structures requiring a high degree of soundproofing efficiency. Rocklath (gypsum lath) is attached to studs and joists so that the lathing base floats free from the structural background, permitting movement in structural members without cracking the plaster.

Three principal advantages are gained by this construction. It is crack-proof against all ordinary movement; it has a soundproofing value equal to many special soundproof constructions; and it reduces the streaking of outside walls and ceilings that commonly shows up in lath marks and joist marks caused by a difference in conductivity values.

DUALOCK—A NEW DEVELOPMENT IN KEY LOCKS

The Dualock is an advanced pin tumbler principle of exclusive design developed by Dudley Lock Co., of Chicago. The key is duplicable accurately only by the manufacturer. It can be masterkeyed for institutional use.

Each cylinder is made to precision limits and must pass a rigid examination. The pin tumblers have sharp square corners on the same radius as the periphery of the cylinder. In order to free these pins from the grooves they must be correctly gathered within the periphery of the cylinder. Should one pin tumbler be pulled down too far or pushed up too far it will protrude on the opposite side and the cylinder will remain locked to the housing. The key has a long, wavy groove and the shank is shaved to dimensions. The groove conforms to these shaved edges—at intervals it is high, pulling a pin up, then low, pushing a pin down. When the key has been inserted all the way, all the pins have either been pushed or pulled into place by the various heights and depths of the grooves. Keys are cut on a misaligned sequence so it is practically impossible to figure a code.

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FOR THE WORLD'S TALLEST**

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General Contractors: Starrett Bros. & Eken, Inc.

MERCHANDISE MART
CHICAGO
Architects: Graham, Anderson, Probst & White
Contractors: John Griffiths & Son Co.
Chief Structural Engineer: M. Gunderson
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AMERICAN STEEL & WIRE COMPANY

WIRE FABRIC

THE STEEL BACKBONE
OF CONCRETE

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Building achievements of the epoch—to challenge time for decades to come. It is significant that these structures employ concrete floor arches. The Empire State Building floors are of the Cinder Concrete Arch type and the Merchandise Mart floors of Stone Concrete.

Doubly significant is the fact that American Steel & Wire Company Wire Fabric was chosen for reinforcement. Note—in the action photograph above—how easily this Wire Fabric is installed; one of the many reasons why it was specified.

1831

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100 YEARS
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1932

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• Albert Kahn, Inc., Architects and Engineers. H. Kelly Co., Heating Contractors. 6,000 sq. ft. of Robras Radiation installed in this building.

for KRESGE'S Administration Building

Rome Convectors have an enviable reputation for quality. This reputation Rome earned and continues to maintain by building to strict standards and by refusing to sacrifice quality to price.

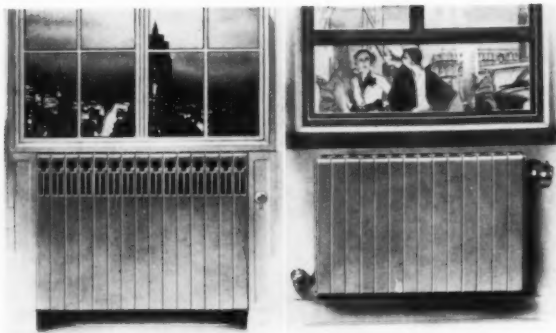
Rome Convectors are available in two distinct types... in two different price fields. ROBRAS, unique in construction, meets unusual requirements of capacity in limited space on all types of low pressure systems. ROCOP, the tubular type, is designed to meet modern standardized building construction requirements.

You can specify Rome Convectors with full confidence as to performance, endurance and the assurance that they will fulfill (with permanent satisfaction) any of the wide range of requirements in modern building construction. Send for our new bulletin.

Rome Radiation Company

DIVISION OF

Revere Copper and Brass Incorporated, ROME, N. Y.



SHAW RADIATORS

This radiator produced by Shaw-Perkins Manufacturing Co. of Pittsburgh, comprises an extended surface steel structure in contact with an internal copper tube. All surfaces, including the exterior, are joined in heat contact with the copper tube. The steel extended surface conducts heat from the copper tube, which contains the heating medium, and gives it off, by convection, to the air which circulates through and over the radiator and also, by radiation, from the exterior surfaces. The Shaw Radiator therefore supplies both convected heat and radiated heat and forms its own cabinet, grille and radiator, all in a single integral unit.

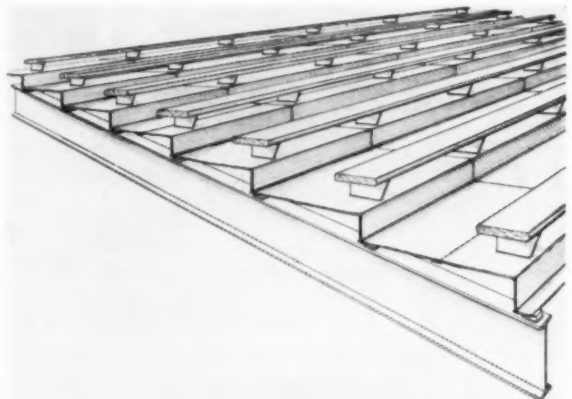
The radiator can be used in several different arrangements. It is furnished with either front or top air outlet grille to meet various installation requirements. Installed fully exposed upon legs or wall brackets, it provides its own radiant cabinet

and grille. When recessed in the wall with the front exposed, it serves as radiator, radiant front panel, inclosure and grille.

ALL-STEEL STADIUM

A new type of all-steel stadium or grandstand has been perfected by The Ingalls Iron Works Company, Birmingham, Alabama. The number of seams are reduced to a minimum and all seams are electric welded. No rivets are used.

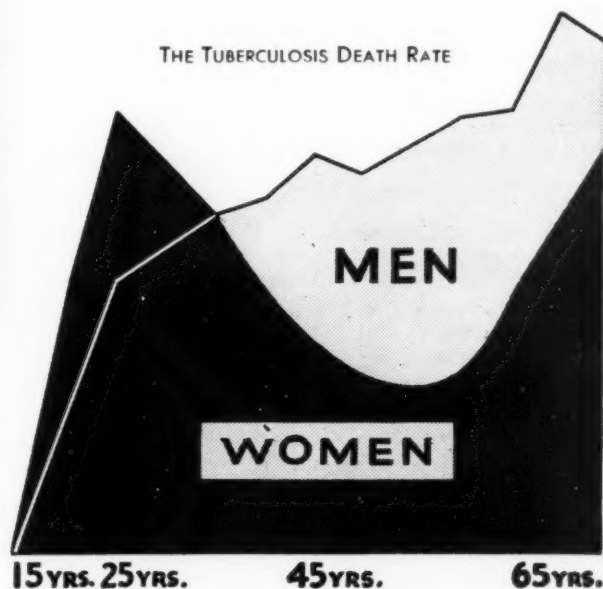
It is claimed that this new type of construction gives greater strength with lighter weight, and is more economical than concrete or other steel structures. In addition it is absolutely watertight, permitting use of space underneath, without damage from leakage.





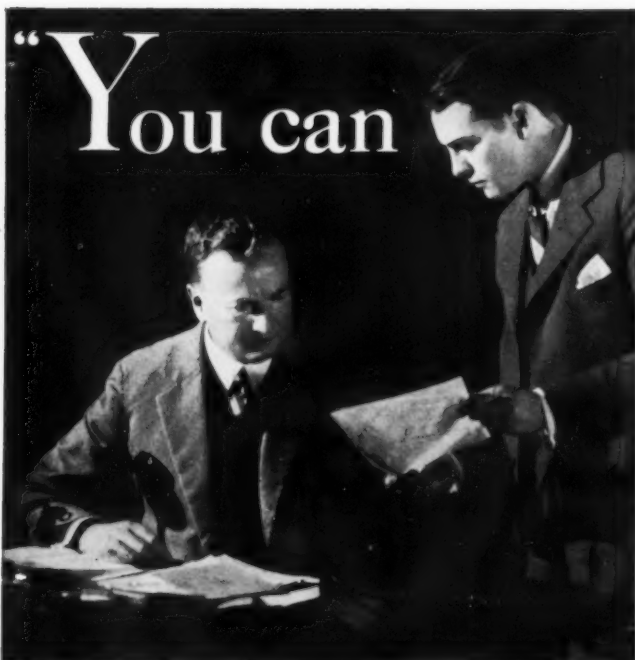
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Needlessly, year after year, tuberculosis takes its great toll. No other disease kills as many persons in the most productive period of life—15 to 45. Examine the peaks. Startling? Yes, for tuberculosis can be avoided and cured. Help flatten these peaks. Your health tomorrow may depend on your assistance today.



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with greater safety and still
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"The saving effected by the use of Calcium Chloride," says a construction manager, the veteran of several big cold-weather jobs, "consists of less time of cement finishers, less amount of canvas necessary, less burning of coke in salamanders,—lower cost of forms, steel and concrete on account of earlier stripping. And it increases the efficiency of the cement."

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AUTOMATIC WATER SOFTENER

A new automatic industrial zeolite water softener has just been announced by The Permutit Company, New York. This softener eliminates errors due to the human element and conducts all operations of softening and regeneration with machine-like precision.

Not only may new models be had in the full automatic type but it is also a relatively simple matter to apply automatic control to existing down-flow softeners thus converting manual to fully automatic operation.

LITH—A ONE-COAT PAINT

Without sizing, and in one coat Lith produces a dense, moisture-proof layer which bonds perfectly to all types of insulating board, paper, plaster, stone, concrete, wood and many metals. It can be scrubbed repeatedly with soap and water.

Lith dries flat, but may be polished to a semi-luster by rubbing lightly with fine steel wool. This semi-luster is permanent and not affected by soap or water. It may be waxed and buffed if desired.

Average coverage on insulating board is 160 square ft. per gallon, one coat not exceeding .005" thickness. The paint is provided in all standard colors including black and white. Produced by Mitchell-Rand Mfg. Co. of New York.

WATER SOFTENERS

"No Scale, No Sludge, No Mud—The Application of Zeolite Water Softeners to the Treatment of Boiler Feed Water" is the title of a 36-page booklet just published by The Permutit Company, 440 Fourth Avenue, New York. It is illustrated with photographs and diagrams and contains tabulated data, conversion tables, factors, reactions, etc. Copies may be obtained upon request to the above company.

PREVENTING LEAKY BRICK WALLS

By JOHN H. MALLON

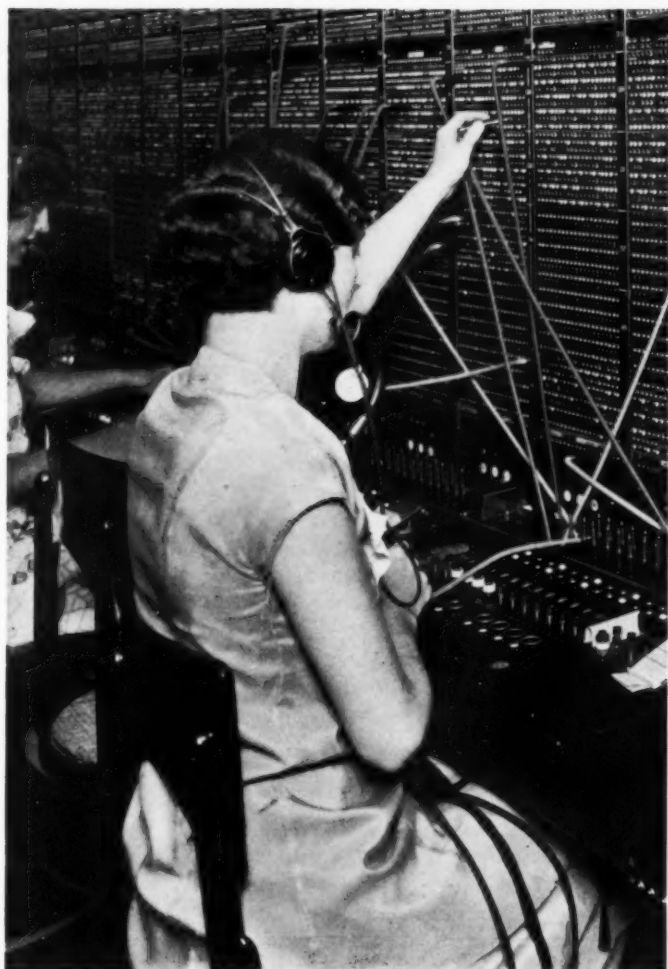
(Continued from page 416, editorial section)

ity to prevent the absorbent brick from sucking the water out of the mortar too fast.

If the mortar loses water and congeals too rapidly, when it comes in contact with an absorbent brick, the next brick placed on or against the mortar cannot be properly bedded, and will not bond with the stiffened mortar. As a result there will be a network of small capillary openings or even distinct cracks between the brick and the mortar through which water will pass. (1, 2)

Mortar should contain an integral stearate waterproofing. (15) If the inside longitudinal mortar joints which parallel the face of the wall are filled with a waterproofed mortar, they are a very effective barrier to the water which gets in past the face brick. But the stearate waterproofing has other and perhaps more important results. Dr. Anderegg

"That number has been changed, Sir!"



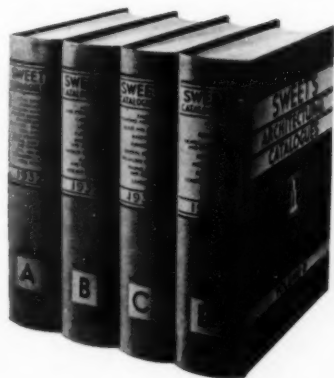
WHEN that comes to you from the voice with a smile, you often discover that you had been consulting last year's phone book. But the mistake is rectified with the loss of only a few minutes.

It's a different matter when you consult last year's catalogues for details or specification data. "Wrong numbers," once they get into your plans and specifications, spread trouble like a contagious disease.

Soon your office will receive a new, up-to-date file of manufacturers' catalogues—Sweet's Architectural Catalogues for 1933—which will replace the old 1932 edition. Many changes have taken place during the past year, both in producers and in products. Important changes have been made in nearly every manufacturer's catalogue in Sweet's.

Distribution will be made about New Year's. That's the traditional time to clean house; to rid your office of the inevitable accumulation of obsolete catalogues and other data. Use the new Sweet's with the certain knowledge that every one of its hundreds of catalogues is up-to-date. Then you will be sure that what you select and specify is still being made and your general contractors, who also will use the new Sweet's, will know exactly what your specifications call for.

Use of the new Sweet's in your office will eliminate "wrong numbers."



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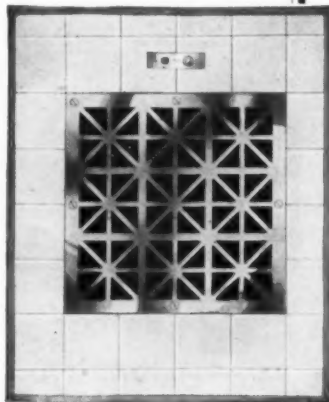
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Full information, details, specifications and estimates on request.

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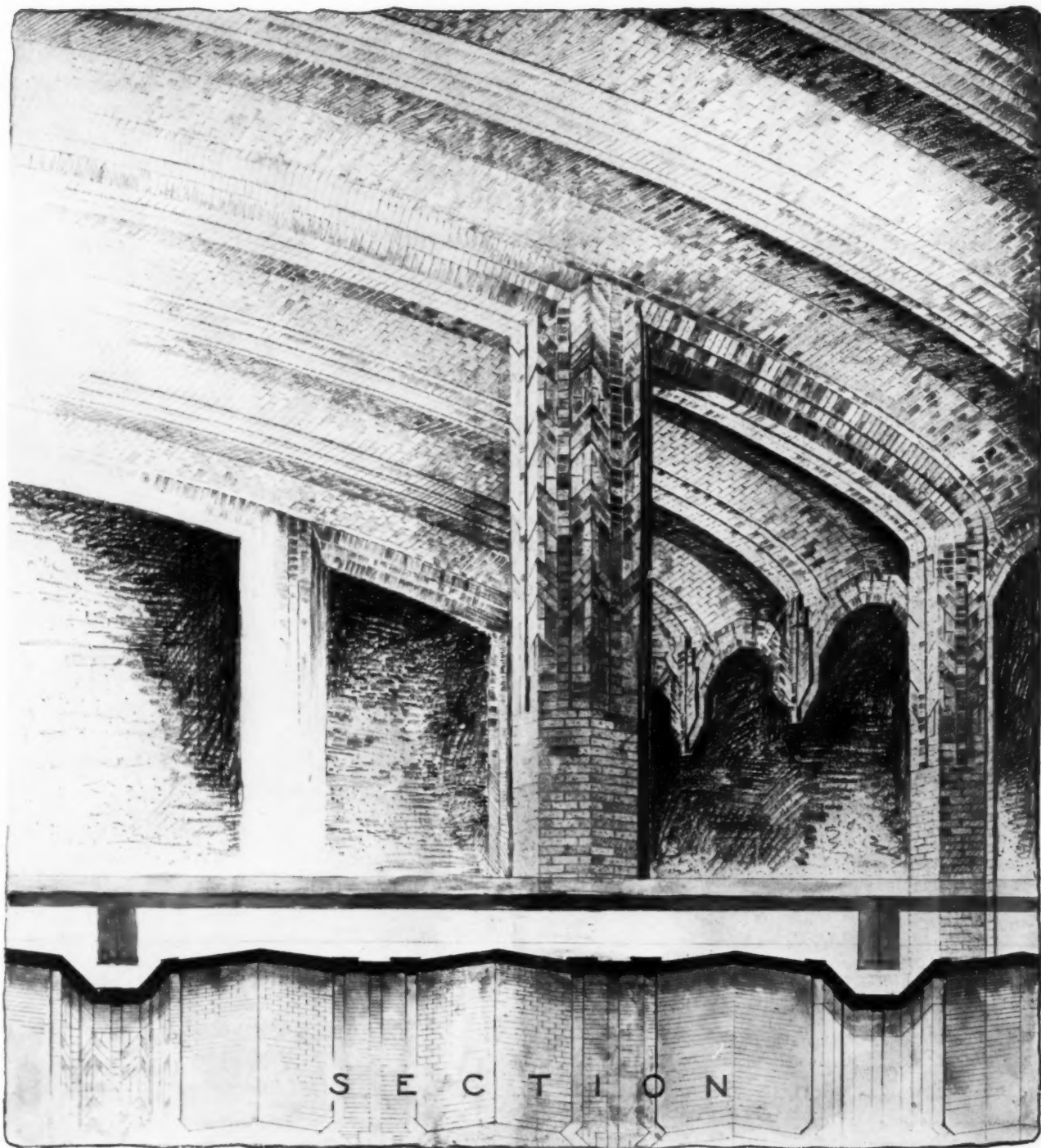
General Offices and Factory
ROCHESTER, NEW YORK

lists its advantages as follows:

- (1) Improved workability.
 - (2) Better wetting of the brick surface.
 - (3) Prevention of shrinkage openings between the brick and the mortar by controlling the rate at which moisture is absorbed from the mortar.
 - (4) Increased weather resistance by lowering the absorption.
 - (5) Improvement in the flexibility of a mortar.
- In fact, Dr. Anderegg goes so far as to make this statement: "Under present conditions of brick-laying, the best assurance of getting a watertight joint between the mortar and the brick lies in the use of a *properly distributed* stearate water-proofer."

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VOORHEES, GMELIN & WALKER
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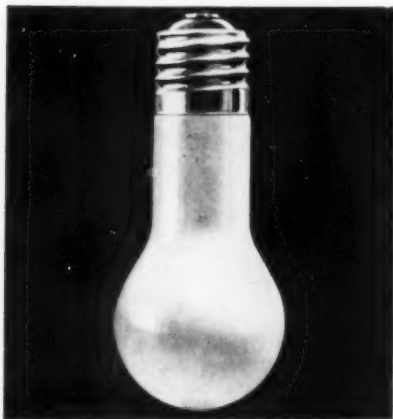
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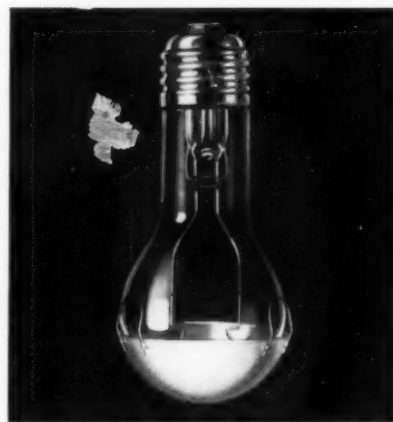


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Give Useful Light *plus*
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Notice these two MAZDA Sunlight Lamps. A pool of mercury in the bulbs of these lamps forms a "mercury vapor arc" rich in ultra-violet. Special filter glass in the bulb cuts out the radiation not found in the best natural sunlight. Goggles are no more necessary with MAZDA Sunlight Lamps than with natural sunlight. The Type S-1 lamp at a distance of thirty inches for a period of ten minutes or the Type S-2 lamp at twenty-four inches for twenty minutes gives the ultra-violet equivalent of best *midday midsummer sunlight*. And both give good light for illumination.



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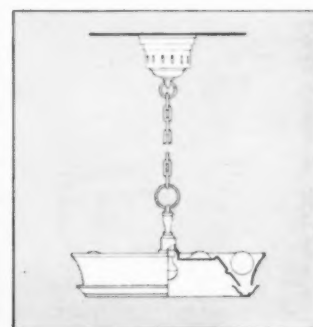
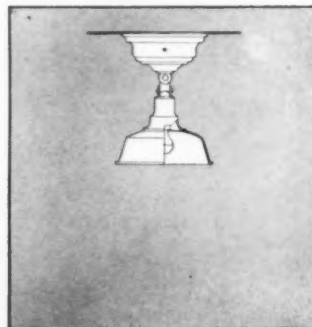
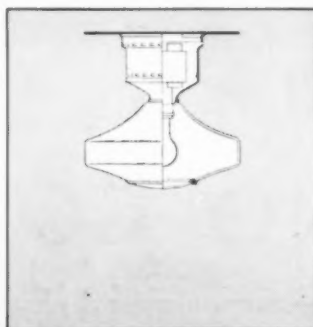
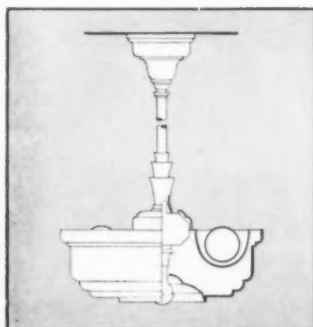
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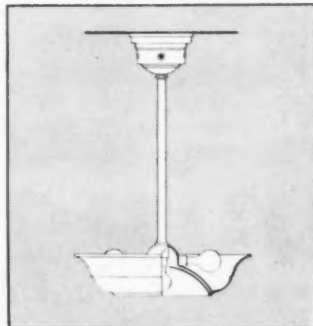
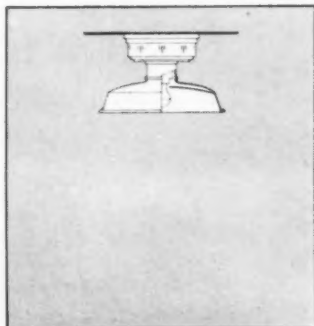
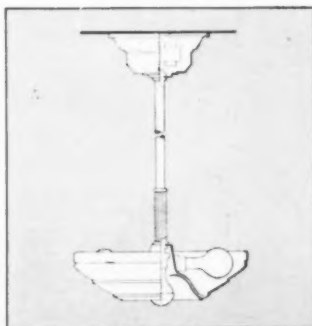
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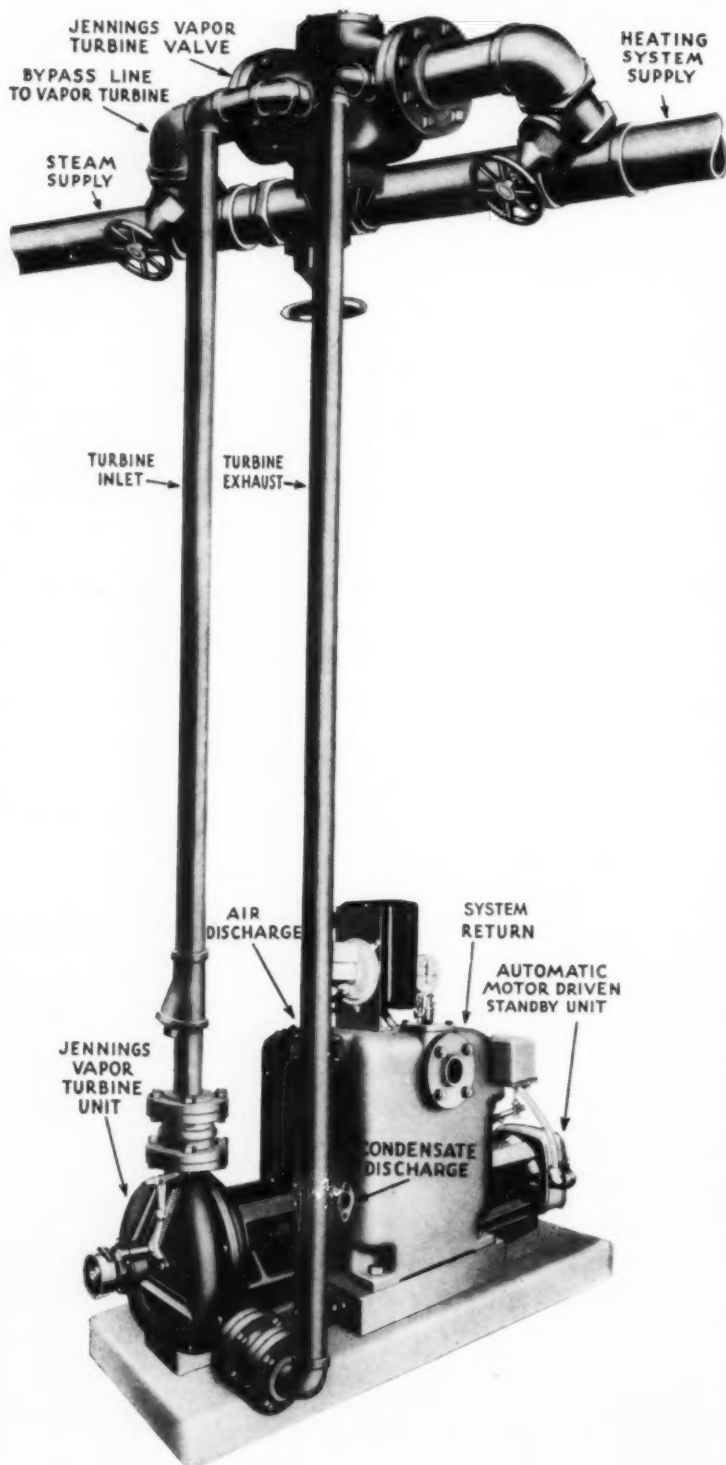
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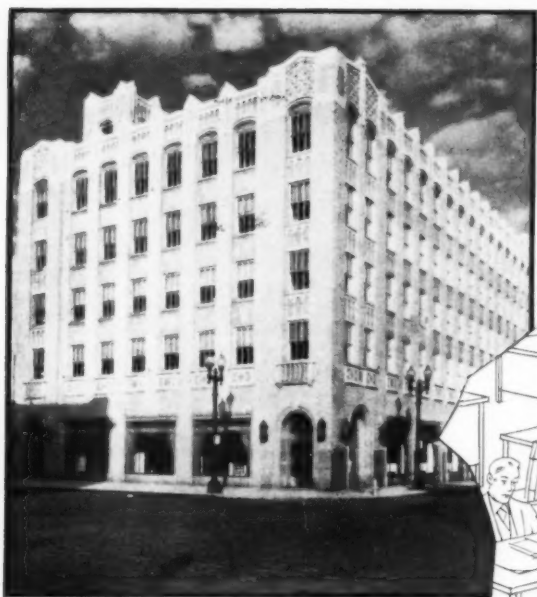
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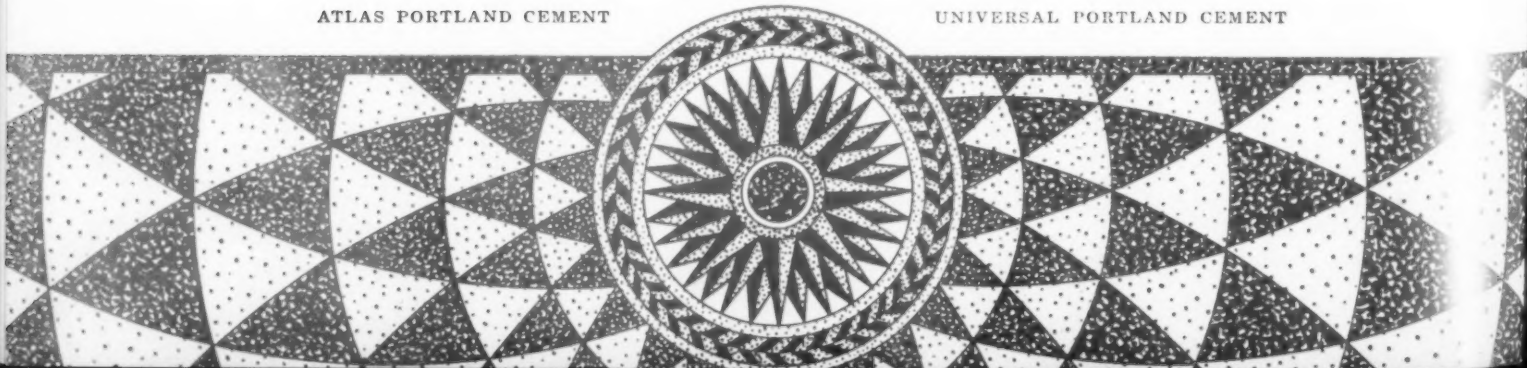
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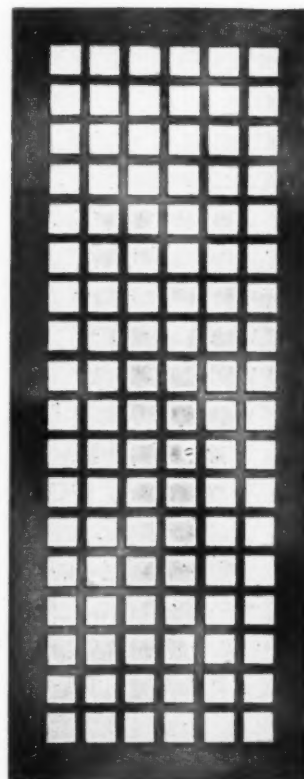
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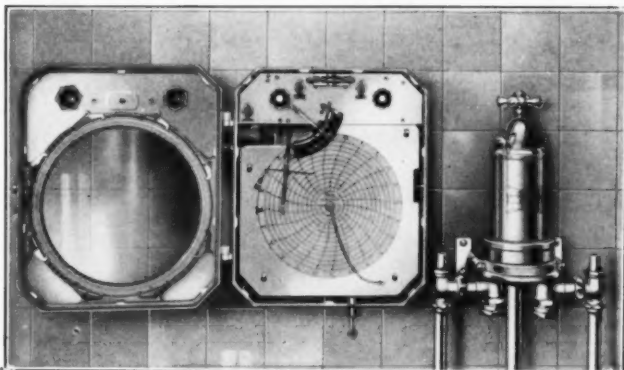
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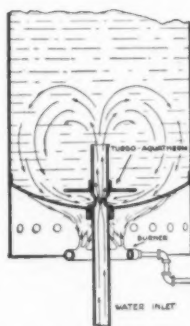
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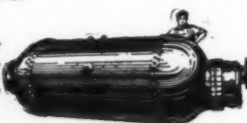
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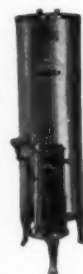
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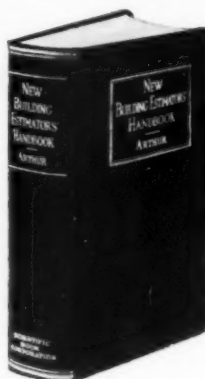
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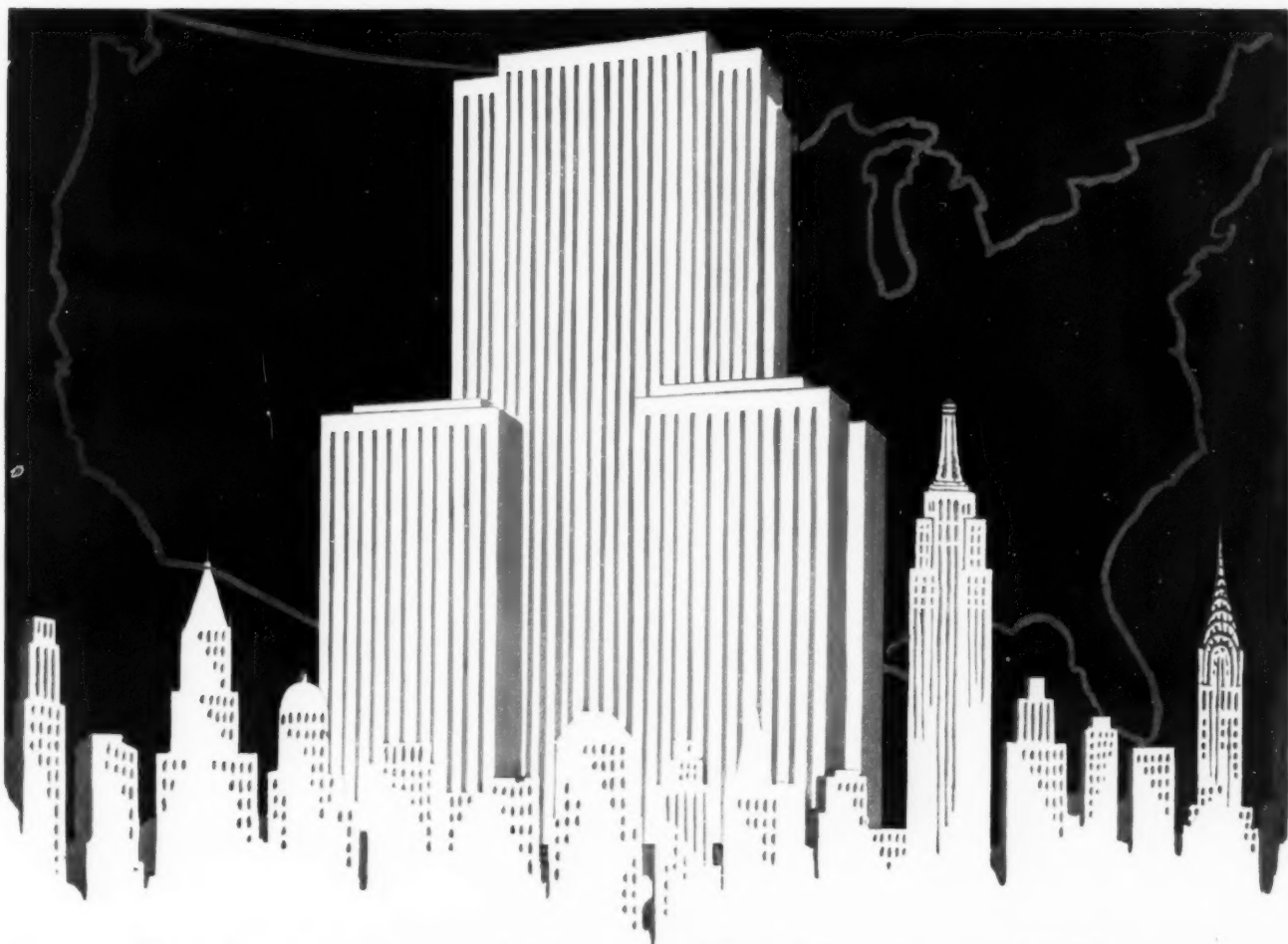
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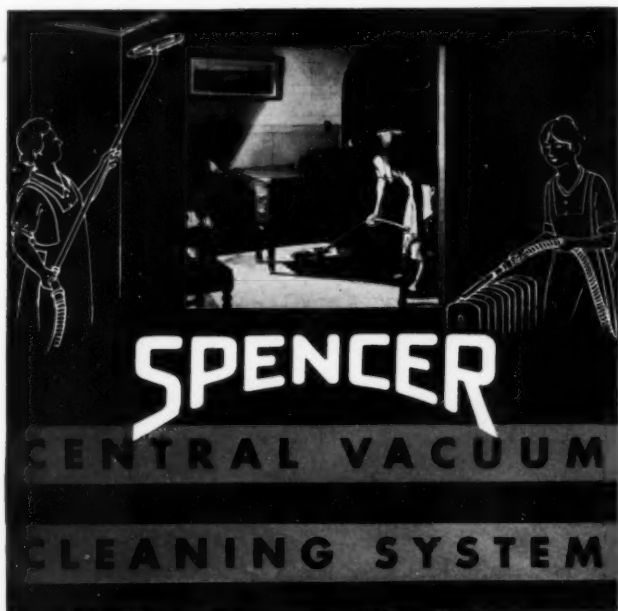
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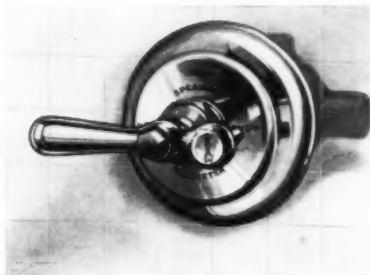
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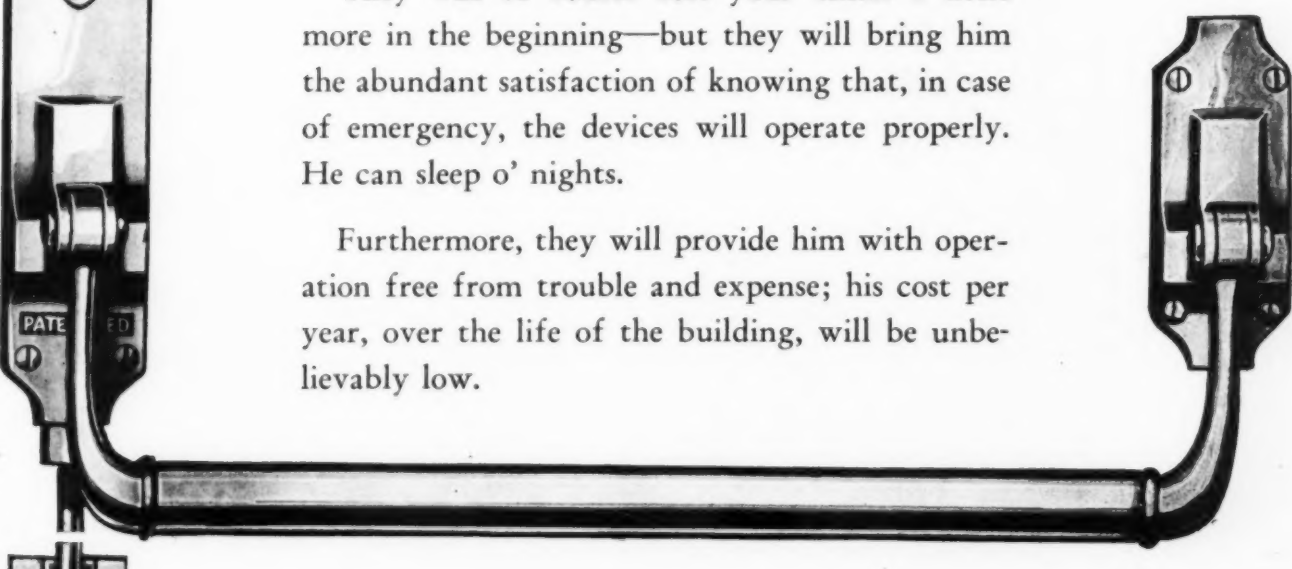
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